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PAPER TRADE JOURNAL

Vol. XCVII JULY 27, 1933 No. 4

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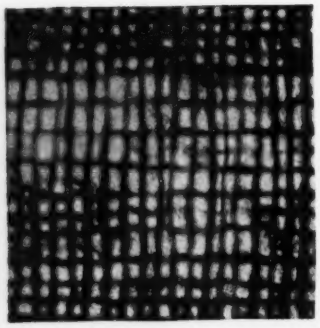

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Entered as second-class matter, March 3, 1925, at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices: 15 W. 47th St., New York, N. Y.

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PAPER TRADE JOURNAL

ESTABLISHED 1872

SIXTY-SECOND YEAR

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Published Every Thursday by the
LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President. J. BANNINGA, Sec.-Treas.

Published at 34 No. Crystal St., East Stroudsburg, Pa.
Executive and Editorial Offices: 15 West 47th Street, New York
Chicago Office: 123 West Madison St.

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Want and For Sale Advertisements, 54-55

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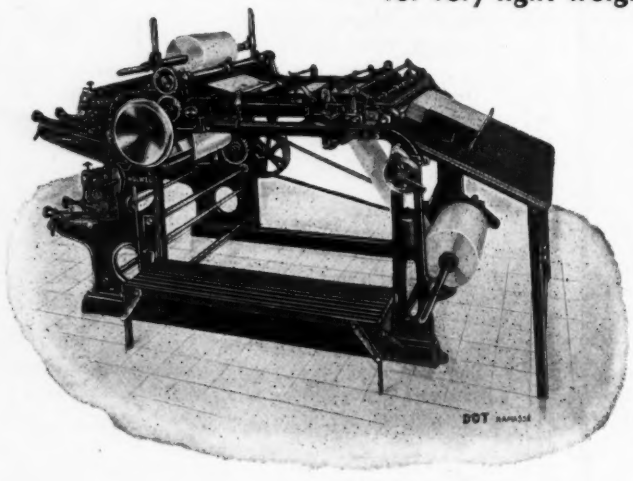

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PAPER

Vol. XCVII, No. 4 Thursday, July 27, 1933

Paper Groups Meet to Act on General Code

S. L. Willson, President of the American Paper & Pulp Association, Calls Representatives of Various Associations for Final Action—W. W. Pickard, Deputy Administrator, Assists in Drafting of the Code, With View of Submitting it to Washington Today, Thursday—Reorganization of American Paper & Pulp Association Also on Agenda

Associations of manufacturers eligible under the General Code of the Pulp and Paper Industry met at the Waldorf-Astoria Hotel, New York, yesterday, Wednesday, upon the invitation of S. L. Willson, president of the American Paper and Pulp Association.

The purpose of the meeting was twofold: to prepare for submission to General Hugh S. Johnson, National Recovery Administrator, a final draft of the general code for the paper and pulp industry; and to act upon the reorganization of the American Paper and Pulp Association, through which the general code for the industry will be administered.

W. W. Pickard, a deputy administrator in General Johnson's office attended to assist in drawing up the code. Each representative of the different Group Associations was empowered to act authoratively for his Group at this meeting. Mr. Pickard has declared that he wished to submit the General Code for the Paper and Pulp Industry to Washington today, Thursday.

It was learned from authorative sources that the meeting would probably last well into the night on Wednesday and no information could be obtained as to just when the code would be available for publication.

Officials of associations of manufacturers eligible under the General Code of the Paper and Pulp Industry and other prominent leaders in the industry, invited by President Willson to the meeting, included the following:

Absorbent Paper Manufacturers Association, 2 Drummond Avenue, Chevy Chase, Maryland. Chairman, D. A. Smith.

American Sulphate Pulp and Board Association, 369 Lexington Avenue, New York. President, H. W. Ellerson; Secretary, O. M. Porter.

Binders Board Manufacturers Association, 370 Lexington Avenue, New York. President, William Foulds, Jr.; Secretary, Caroline L. Lloyd.

Book Paper Manufacturers Association, 15 William street, New York. Chairman, G. H. Mead; Secretary, R. S. Berry.

Cardboard Manufacturers Association, c/o Champion Coated Paper Company, Hamilton, Ohio. President, H. W. Kramer; Secretary, Kendall Wyman.

Cover Paper Manufacturers Association, 95 State street, Springfield, Mass. President, Russell Madden; Secretary, E. H. Naylor.

Glassine and Greaseproof Manufacturers Association 370 Lexington Avenue, New York. Chairman, Robert F. Nelson; Secretary-Treasurer, Thomas J. Burke.

National Paperboard Association, 1 Wall street, New York, and 608 Dearborn street, Chicago. Chairman, William P. Jeffrey; President and General Manager, G. R. Browder.

Vegetable Parchment Group, Fidelity-Philadelphia Trust Building, Philadelphia, Pa. Attorney, Joseph M. Dohan.

Writing Paper Manufacturers Association, 95 State street, Springfield, Mass. President, H. R. Baldwin, Secretary, E. H. Naylor.

A. R. Graustein, president, and N. C. Head, vice-president, International Paper Company, New York.

N. W. Wilson, first vice-president and general manager, Hammermill Paper Company, Erie, Pa.

David L. Luke, Sr., president, West Virginia Pulp and Paper Company, New York.

Winthrop L. Carter, president, and Varco E. Nunez, vice-president, Nashua Gummed and Coated Paper Company, Nashua, New Hampshire.

Henry D. Schmidt, president and treasurer, Schmidt & Ault Paper Company, York, Pa.

John L. Riegel, executive vice-president and general manager, Riegel Paper Corporation, New York.

Charles A. Gordon, vice-president, Oxford Paper Company and Oxford Miami Paper Company, New York.

D. K. Brown, first vice-president and general manager, Neenah Paper Company, Neenah, Wis.

Ball Bros. Buy Eaton Paper Mill

[FROM OUR REGULAR CORRESPONDENT]

MUNCIE, Ind., July 24, 1933.—Purchase by the Ball Brothers Manufacturing Company, here of the straw board plant at Eaton, subsidiary of the United Paper Board Co., of New York, has been announced by W. H. Ball. Approximately 110 men will be employed when the plant, which has been idle for three years, resumes operations. It is hoped to get into production in about two weeks. Former employees will be given preference. The plant will work three eight-hour shifts daily. The Easton plant primarily will serve as an auxiliary to the present plant of the company at Noblesville, Ind., and probably will be known as the Eaton Paper Mills.

More Paper Mills Advance Employees Wages

Paper Manufacturers in All Sections of Country Continue to Loyally Support Administration's Efforts to Bring About General Industrial Recovery—International Paper Co. Announces Increases for Staffs of Its North American Plants

Reports from all divisions of the paper industry continue favorable, in keeping with the Administration's efforts to accomplish industrial recovery. Dispatches received from different sections of the country announce more increases in wages and salaries by representative paper manufacturers, including the following:

International Paper Company; Marathon Paper Mills Company; Marinette & Menominee Paper Company; Hummel & Downing Company; Munising Paper Company and the Detroit Sulphite Pulp and Paper Company.

International Paper Co.

Following an increase in the consumption of all its products, International Paper Company has announced an increase in wages and salaries in its mills in the United States, Canada, and Newfoundland, effective July 30, which will approximate $2,000,000 a year. The Company, in announcing the increase, expressed appreciation of the cooperation shown by its employees, particularly since the application of the last wage reduction. The price of news print, the company's principal paper product, is not raised by the News Print Code filed in Washington on Monday, but the prices of other lines and the volume of all its products have shown increases in the last sixty days which justify the company in including the employees in news print mills in the wage increase.

Marathon Paper Mills Co.

Wisconsin paper mills are not waiting for adoption of the federal code for the industry before granting the wage increases urged in the Industrial Recovery Act. Last week three large companies announced higher scales. The Marathon Paper Mills Company also took this step several weeks ago in its various mills and converting plants.

Marinette & Menominee Paper Co.

The Marinette & Menominee Paper Company, Marinette, Wis., announced a general wage increase of 11 per cent for the M. & M. mills and for its subsidiary, the Victory Bag and Paper Company, according to A. B. Hansen, general manager. The change goes into effect July 30, and will benefit 365 employees in the two concerns.

Hummel & Downing Co.

Increases at the Hummel & Downing Company, Milwaukee, establish a minimum wage of $15 for a maximum 40-hour week. The minimum hourly rate is increased from 35 to 37½ cents, and runs all the way up to the 80 cents an hour brackets. A minimum hourly rate of 25 cents is established for women employees. It is estimated by John L. Barchard, president, that the firm's yearly pay roll will be increased $30,000 to $40,000. This action does not affect bonuses earned by production incentive methods. "Wages are being raised, not 'as, if and when' the industry receives its code, but right away," said Mr. Barchard. He feels that the buying power of the people had to keep abreast of commodity advances.

Munising Paper Co.

C. H. Worcester, president of the Munising Paper Company, operating paper mills at Munising, Mich., announces a bonus of 5 per cent of June salaries is being paid all employees of the company. The Munising Mills manufacture the watermarked Caslon line, together with unwatermarked sulphite bond and sulphite specialties. Mr. Worcester advises that the mills operated at normal capacity during June and present orders indicate same operation during July.

Detroit Sulphite Pulp & Paper Co.

Three hundred employees of the Detroit Sulphite Pulp and Paper Company, have had their wages increased five cents an hour. W. T. Schmitt, chairman of the company's board of directors, announced. The increase affects all classifications of employees on an hourly basis of pay and is made "in the spirit of the Administration's wishes in regards to wages," officials said. So far it has not been applied to the salaried employees, they said.

Standard Paper Mfg. Co.

RICHMOND, Va., July 23, 1933.—As Chamber of Commerce officials yesterday planned to map out this City's part in the wage-increase and shorter work hour program embodied in the national recovery setup, a voluntary increase of 10 per cent to 275 wage-earners was announced by the Standard Paper Manufacturing Company here.

No salaried employees are affected, Treasurer Howard S. Donald announced, but the raise will add $500 to the plant's weekly pay roll, or over $2,000 a month. The increase becomes effective tomorrow.

Mr. Donald stated that wage increase is the company's immediate participation in the industrial recovery program of the President. The increase restores nearly one-half the cut suffered by wage-earners during the depression. Previously the Du Pont rayon and cellophane plants and the Albemarle Paper Manufacturing Company here raised wages.

Muncie Paper Mill Starts

INDIANAPOLIS, Ind., July 24, 1933.—The paper mill at Muncie, Ind., of the Hinde-Dauch Paper Company began operations this morning. Only workmen employed by the company when the plant discontinued operations a year ago were put on the payroll. Workmen have been cleaning the plant grounds and interior for a week. "The outlook is good," a spokesman for the company said, "but of course, we are dependent entirely on whatever is done by the industrial administration at Washington. Our code is yet to be determined and until it is adopted we will be at a loss to know what to expect." He declined to say how much work the company had received, but insisted that only the mill would resume operations at this time.

Cigarette Paper From Spain

WASHINGTON, D. C., July 19, 1933.—Exports of cigarette paper from Spain during the first four months of this years show a rise as compared with the corresponding period of 1931 but are still somewhat under those for the corresponding of last year according to the Department of Commerce. The bulk of these shipments are in the form of roll and large sheets, 127,340,341 pounds of this class being shipped this year as against 26,124,730 pounds in packets. Exports to the United States so far this year totaled 8,844,414 pounds.

New England Paper Manufacturers Very Busy

Several Mills Possess Orders Ahead Which Will Take Considerable Time to Complete—Various Standard Grades of Fine Paper Exhibit Upward Trend—Quotations on Certain Papers, Including Tissues, Withdrawn—Box Board Fairly Active

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., July 24, 1933.—Taken as a whole, the paper market was somewhat less active last week, although at least a fair volume of merchandise was sold. Jobbers are now maintaining their usual stock, which they had not been doing for a considerable period, but it is said that the big houses are not speculating to any extent, if at all.

The larger buyers of paper "have loaded themselves up to the gunwales," according to a statement in the trade, thinking to cover for a while against price increases, but smaller buyers who are limited in capital or credit find it more difficult to purchase for future requirements. Department stores and some other consumers of wrapping paper have been buying more than previously. Printers, however, have bought for immediate requirements only. They don't know what grades of paper they will need.

Mills are very busy. Some manufacturers have orders ahead which will take considerable time to finish. Prices on book papers and offsets advanced during the week and white paper generally is on the upward trend, owing to the increasing cost of raw materials. Sulphite bonds are advanced today. Manufacturers for their own protection continue to withdraw prices on certain papers, such as tissues. "War times are not in it with these times." The box board business was not quite so brisk as it was, but was still fairly active.

The paper stock market continued very strong and active, except for roofing rags, which declined in price. Shipments of foreigns ordered some time ago have reached here in large quantities. Mixed papers were on the advance again, rising to .62½ @ .65 against a former range of .57½ @ .62½. Other increases were in white blank news, which rose to 1.20 @ 1.30 compared with 1.15 @ 1.20, No. 1 old manila to .90 @ 1.00 against .70 @ .80, and print manila to .80 @ .85 against .65 @ .80. No. 1 roofing stock fell off to .90 @ .95 from 1.10, No. 2 to .80 @ .85 from .85 @ .90, and No. 3 to .45 @ .50 from .50 @ .55.

Storage Rates Protested

At a hearing held before the New England Freight Association at the South Station, Tuesday, C. L. Whittemore, traffic manager of the New England Paper & Pulp Traffic Associated, protested against the proposed increase in storage rates of the Boston and Maine Railroad at its tidewater terminal sheds. The proposed rates are 40 cents per ton per month compared with the present rates of 15 cents, possibly eliminating the 15 days free time, to apply on all pulp shipped from the docks by truck. The 15 cent rate would still apply to shipments by rail.

Mr. Whittemore held that the railroad charges are very high, even at 15 cents, that the 40 cent rate is indefensible and perhaps illegal, that it would not divert tonnage to the railroad which mills are still able to ship more cheaply by truck than by rail. The association took the matter under advisement. As the proposal comes soon after that to increase rates on pulp from Boston to Central Freight Association territory, any advance in rates would work an additional hardship on the mills and importers using the Port of Boston.

News of the Trade

The Brown Company, of Portland, Me., which has a Boston selling office, is just as busy, and is thirty days behind in filling its orders on bonds, ledgers, printing papers, Bristols, cover papers, post card sheets, etc.

The Andrews Paper Company now has additional warehouse facilities at 39 Warren avenue, Charlestown, Mass.

Henry L. Goodman, dealer in box papers, has returned from a motor trip to Chicago, on which he was accompanied by his wife and son. They found the World's Fair wonderful and had a drive in delightful weather both ways. While in Chicago they met Samuel A. Cohen, president of the Acme Paper Box Company, and his wife.

Warren D. Thompson, of the sales staff of the Baird & Bartlett Company, was at Long Lake, Harrison, Me., last week for a vacation, on which he was accompanied by his wife.

E. R. Harris, of the Mead Sales Company, New York, which handles the products of its mills, including chestnut board, test liner and other grades, called on the trade last week.

James Flett, managing director of the paper stock organization which collects waste paper by contract with the Boston Retail Trade Board, was in town last week.

The Boston Safe Deposit and Trust Company has leased floor space in the building at 161-163 High street to the Doty Paper Company.

Indiana Paper Mills Busy

INDIANAPOLIS, Ind., July 24, 1933.—While there has been little change in the paper market in this area during the last week, the trade seems to be having little difficulty in keeping up production to the levels it has assumed. Virtually all the paper mills of the state are producing almost tc capacity and other plants that have not yet got back into production after long idleness report good volumes of orders, so the limitation of hours will put many more persons to work. In some cases increases in pay were made before any government manifestos were issued.

Just now the wholesale trade is in the midst of the summer dull period, yet the sales volume will not show the usual recessions for this period. Summer specialties particularly are having about the best year they have had for a long time. Extremely hot weather during the last two weeks, coupled with the record breaking June served to keep demand for all summer specialties far ahead of the regular trade demand.

Of all the different factors in the paper trade, the paper stock men seem to have been particularly favored. Mills are buying stock with a readiness that is delightful to the stock man. However, these same paper stock men spent many anxious months with mills definitely out of the market, or buying for a little or nothing. Their warehouses were full to bursting and money could not be turned.

The fine paper demand is holding up well. With the reduction of postage for intra-city deliveries, there have been a lot of advertising campaigns under way. The lithograph plants and printing establishments that cater largely to catalogue work and poster advertising, report a good demand. Container factories report continued inquiries and a satisfactory volume of orders. Demand for bags and wrapping also is increasing in line with other grades.

Masonite Wins Celotex Infringement Appeal

Decision of Circuit Court of Appeals Assures Corporation Virtual Control of Pressed Board Industry—Manufacturers of Wall Board and Pressed Board Apply for Permission to Make Bagasse Products Under Licenses and Royalties

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 24, 1933.—Virtual control of the pressed board industry of the country rests with the Masonite Corporation, Laurel, Miss., through a decision handed down by the United States Circuit Court of Appeals at Philadelphia, according to a copy of the decision reaching Ben Alexander, Wausau, Wis., president of the corporation.

The Masonite Corporation was victorious in a suit it appealed to the federal court from a decision of the district court of appeals in Delaware. The company claimed that the Celotex Company infringed on both its products and process patents in making a pressed board similar to Masonite "Presdwood," the company's trade name for its leading product, made out of bagasse (sugar cane fiber).

In the decision of the district court it was stated that bagasse was not wood or woody material such as the Masonite company claims. The U. S. circuit court of appeals reversed the decision, stating that the Celotex Company did infringe on the Masonite patents and that the Masonite patents were found valid for products made of wood, woody material, or generally speaking, all cane ligno-cellulose material, virtually covering all the vegetable kingdom.

Since the decision was handed down, a number of wall board and pressed board products manufacturers have applied to Masonite for permission to manufacture the products under licenses which give the Masonite company the right of royalties, Mr. Alexander declared.

A decided turn for the better has been noted in the volume of business and profits of the Masonite Corporation in the last ninety days according to Mr. Alexander. Prospects of increased business for the future are bright. The Laurel plant is equipped to produce 15,000,000 feet of pressed board products a month. The company manufactures insulation board, quarterboard, flooring, Presdwood, Temprtile and all other synthetic wood products and has enjoyed a profitable business since its organization many years ago.

New Power Dam Projected

Possibility of a new government power dam at Menasha Wis., controlling the flow of water for Fox River Valley paper mills looms prominently in the government's construction program. Borings are being taken by the federal engineering department to determine the condition of the foundations of the present dam, which has been in service for more than sixty years. After the survey is completed, plans and specifications will be completed by the war department and the cost data for a new dam will be determined. The department has indicated its intention to build a new dam but has not made a definite announcement.

Weather Bureau Operations

Objection has been made by the Wisconsin Valley Improvement Company, Wausau, Wis., to the government's plan to discontinue weather bureau operations as a means of economy. A resolution sponsored by Grover Keeth, of the Marathon Paper Mills Company and Edward Gleason, of the Nekoosa-Edwards Paper Company, and presented at a meeting of engineers and water power operators from various paper mills of the Wisconsin River Valley at Wausau, Wis. recently, was adopted. It sets forth the value of the equipment and records, especially the maintenance and use of rain gauges. It is desired that the records and equipment be retained at Wausau. Volunteer help is offered in the bureau work to do away with a full time weather employee.

Storage Reservoir Proposed

The value of the proposed storage reservoir on the Big and Little Eau Pleine rivers, tributaries of the Wisconsin river, was explained by Assemblyman F. E. Bachhuber, in an address before the Kiwanis club at Wausau, Wis., last week. The project is contemplated by the Wisconsin River Valley Improvement Company, and was given legislative approval recently. The reservoir will hold 24,000,000,000 cubic feet of water, and four dams will be needed on the rivers to hold the water back. It will require about 30 days to fill the basin, after which the power flow in the Wisconsin river will be uniform at all times. The reservoir will be about twelve by seventeen miles in size, and two-thirds the size of Lake Winnebago, which stores the water for the Fox river. The project will cost more than $4,000,000 to complete, but will be of untold benefit to water power users and to sportsmen as well because of the new fishing facilities. Mills will pay tolls to the Wisconsin Valley Improvement Company to maintain the cost of operations.

News of the Industry

The second pulpwood raft of about 8,000 cords has been brought safely across Lake Superior to Ashland, Wis., for the Consolidated Water Power and Paper Company. The wood comes from Pigeon River, Canada, and is towed by the company's tug *Butterfield*.

Employees of the Marathon Paper Mills Company's mills at Ashland, Wis., enjoyed their annual picnic last Saturday. The entire day was devoted to amusements at Prentice park, including contests between crews of the mills.

Grounds around the Badger Tissue Mills, Kaukauna, Wis., have been beautified this summer. An old water mill has been constructed on a creek running through the property, and the banks have been lined with stone. A rock garden and flower beds have been placed on the property and the grounds have been graded for a lawn.

The upper dam of the Marinette & Menominee Paper Company, Marinette, Wis., was out of service for a day last week while repairs were made to the flume. All of the water in the lower dam was released until the work was completed.

Frank J. Paukert, chief engineer of the Wisconsin River Paper and Pulp Company, Stevens Point, Wis., suffered a fracture of the right leg in a 15-foot fall at the mill last week. He received a shock when he climbed a ladder to throw a switch, and dropped to the floor. He also suffered body lacerations. He is confined to the hospital.

E. A. Oberweiser, president of the Whiting-Plover Paper Company, Stevens Point, Wis., has been appointed to an advisory committee named by the Wisconsin Banking Commission to fix maximum interest rates on small loans made by finance companies in the state. He represents the employers of the state.

Demand for scrap paper in local mills is increasing to such an extent that prices have advanced materially. Lower grades that had been bought at $3 and $4 a ton are now commanding upwards of $12. No. 1 packing grade, which had slumped to $12 and lower now brings $18 to $20 a ton.

Canadian News Print Conditions Unchanged

General Consensus of Opinion Expressed in Montreal That Code Adopted by U. S. Manufacturers Leaves News Print Paper Situation Obscure as Ever—While Demand Has Increased Slightly, Menace of Possible Lower Prices Remains

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 24, 1933.—There has been a good deal of comment here in regard to the News Print Code which United States manufacturers have filed with the National Industrial Recovery Administration at Washington, and the general consensus of opinion is that it leaves the news print situation here as obscure as ever. Some increase in demand for news print has had a note of encouragement to the outlook, but the menace of possible lower prices remains, and nobody knows when a further outbreak of cut-throat competition may take place.

Colonel Price, the head of Price Brothers & Co., remarking in an interview that "we've only had half a scrap so far," stressed the danger of lower prices, saying that while the official price for Canadian news print was $40 per ton in United States funds, delivered in New York, there were American concerns selling for as low as $31 per ton. Lower prices, he continued "would probably result in a price-cutting war."

"If there is real scrap," he continued, "nobody knows what will happen. The only thing is that the paper companies are in such bad shape that they cannot carry on for any length of time. In so far as Price Brothers are concerned, a good deal of our business is done with England and the pound sterling, so that we are not affected by the drop in exchange as regards the United States dollar."

One proposal which has been put forward in the press is that a Royal Commission, with members from Quebec, Ontario and New Brunswick, should be appointed to investigate the future of the news print industry in Canada, but various prominent operators have given the opinion that this is unnecessary.

From the general financial standpoint the position of the news print companies remains unfavorable and the need for reorganization is still indicated. The position is practically the same as it was a month ago, when it was set forth by a prominent Canadian executive in the following summary: "Conditions have forced many of the largest news print producers in Canada into receivership, bankruptcy, or the hands of bondholders' committees. Unsound and destructive competition, together with excess capacity, are responsible for the present serious situation." In some quarters, however, it is thought that the matter of excess capacity is not so serious as is generally supposed. Original capacity of the Canadian mills is placed at 3,500,000 tons per annum, from which, it is said, 1,000,000 tons may be deducted for obsolescence. Production last year was about 1,800,000 tons.

News Print Securities

One feature to which attention is being drawn is the fact that during the past week or so some interest has been paid by the public in the stocks of the various larger news print companies, with the result that these have appreciated in value. Both bonds and common stocks have come in for attention, the advances in price ranging well over 100 per cent for bonds and much more for common stocks. Some of the latter, which for a long time were quoted in cents are now quoted in dollars.

Anglo-Newfoundland Offering

Anglo-Newfoundland Development Company, Ltd., has offered £1,750,000 of 4½ per cent, first mortgage debenture stock on the London market at 98 to provide part of the necessary cash to redeem the bonds and pay off the preference stock of the predecessor company of the same name. The new company was incorporated in Newfoundland, and has acquired the undertaking and assets of the predecessor. The share capital of the new company is $15,000,000, authorized, $7,264,500, to be issued, in $5 shares.

The properties acquired consist chiefly of a paper mill, land, timber limits, power plants, steamships, terminal facilities, and a large interest in the Buchans mine through 98 per cent of the stock of Terra Nova Properties, Ltd.

The predecessor company has been the chief source of paper supply for the *London Daily Mail* and its associated newspapers, and for Newfoundland newspapers. The manufacturing costs of the paper plant of the company are said to be among the lowest in the industry.

The service of the interest on the new debenture stock, amounting to £122,500 per annum, will be secured by a first charge on proceeds of sale of news print paper up to that amount per annum received from Associated Newspapers Ltd. The average consumption of the latter company for the last six years is stated to have been worth £1,250,000 per annum at present English prices for news print. A contract to supply Associated Newspapers Ltd. with all its news print for 25 years is held by the company.

Pacific Mills Report

A. B. Martin, president of Pacific Mills, Ltd., one of British Columbia's largest news print producers, states that during the past year operations showed a net profit of $36,-242, after bond interest, income taxes, depreciation and deflation. This compares with a profit of $215,904 for the previous year.

Bathurst Operates Full Time

Advice from Bathurst, N. B., states that the pulp and paper plant of the Bathurst Power and Paper Company has gone on full time for the first time in several years. News print is being shipped to Great Britain, it is stated. The mill has a capacity of 140,000 lbs. of news print per 24 hours.

A Mile of Paper Signatures

One of the popular signature securers at A Century of Progress World's Fair is the mile-long roll of paper at The Paper Foundation Exhibit in the Graphic Arts Division, General Exhibits building.

Up to July 18 exactly 22,668 had signed their names and addresses on the roll that will be forwarded when complete to Congress with a petition for 2 cents postage.

The roll, 7½ inches wide and containing a mile of paper, was donated by George H. Gerpheide, president of the Hawthorne Paper Company, Kalamazoo, Mich. It is Uncle Sam Bond, a watermarked rag content sheet.

According to Phil A. Howard, president of The Paper Foundation, who is managing the Paper Exhibit, approximately 100,000 have visited this exhibit since opening. The smallest paper machine in the world, 17th Century hand-making of paper, and the "House of Paper" are some of the other star attractions.

Philadelphia Paper Market Shows Improvement

Volume of Sales of Various Standard Grades of Fine Paper Well Maintained—Due to General Expansion of Industry in Pennsylvania, Consumption of Coarse Paper Gains—Kraft Wrapping Paper Quotations Advance Slightly—Paper Stock Continues Buoyant

[FROM OUR REGULAR CORRESPONDENT]

Philadelphia, Pa., July 24, 1933—July, which today is entering on its last lap is—so far as the fine paper houses are concerned—about like the corresponding period of June, and this they regard as good. But the July of 1933 so far is ahead of the July of 1932, and this, of course, is much better. Comparison of the present with the past month reveals the fact that instead of the customary falling off of business, retail sales are about equal to those of June, and this is looked upon as a distinct gain. On the other hand, it must be admitted that thus far the fine paper houses have not markedly experienced the upward trend in industry generally, reports of which come from so many sources. The largest consumers of fine papers—the printers and publishers—are still rather quiet, although they are entirely hopeful as the result, not so much of orders, as of inquiries. Indications point to the launching of large direct-by-mail and other advertising campaigns timed for the return of the vacationists and it is the routine of business and inquiries preparatory to such campaigns that are heartening the fine paper branch of the industry.

But the coarse paper market seems to be in much better condition. There has been unquestioned improvement in the great textile manufacturing business in Philadelphia and its consumption of coarse papers is one of considerable magnitude; the shoe industry—also liberal consumers—is also enjoying a decided improvement. The most encouraging increase in business, however, has come, not so much from the Philadelphia trade, as from such Pennsylvania industrial centers as Scranton, Wilkes-Barre Reading and others. Throughout the coal regions there is activity almost approaching prosperity, and business in these regions is excellent. Likewise, coarse paper and some fine paper requirements from the numerous cigar manufacturing plants throughout the State show a very decided betterment. The noteworthy feature of the week was the slight advance in kraft.

The paper stock trade continues to enjoy, for the first time in a few years, a profit, as a result of the immense betterment which continues steadily after two months of almost daily continued advance. The outstanding developments of the week were the advancing prices in almost every item of the better grades of paper stock, notably No. 1 and No. 2 Hard White, and No. 1 and No. 2 Soft White, and Solid Ledger stock. No. 1 and No. 2 Mixed, writing paper and books, heavy and light, were in better demand from the mills, but while outside prices usually maintain, these grades were not moved up. Printers and publishers, as noted above, are not yet very large producers of the better grades of paper stock, and so with good mill demand and small quantities on the market it is entirely cleaned up. Coarse papers are still moving upwards despite the very heavily increased activity on the part of collectors.

During the week an item in the Philadelphia newspaper of largest circulation announced in a boxed paragraph that City Hall officials, who a year ago had disposed of certain waste for $15, secured $93 for its waste last week. The item did not indicate that the qualities were the same (which they were not) or that the amounts were equal, and these were not. The effect of this paragraph was, however, startling, and now all over the city, the unemployed and even children are making house to house canvasses for waste paper in the belief that a fortune awaits them. Prices advanced slightly but the increased amount that is coming into the warehouses of the packers is being taken by the mills just as fast as it is accumulated and at prices more often approaching the outside than the inside quotations.

One of the smaller packers is so eager to secure supplies that he has representatives on the street to shove his card into the bag or barrel of any waste paper collectors whom they chance to meet. It was a commentary on the situation this week that one of such cards was placed on the truck of the leading paper packer in this city.

Paper and Cordage Outing Winners

Official recognition was given during the week to the winners in the program of sporting events held by the Philadelphia Paper and Cordage Association at its recent outing. The events were conducted under the chairmanship of Leslie C. Bartlett, of the Eastern Paper Company. In the golf match the low net was won by George Howarth, with William A. Hentz runner up, and the high score by Fred. Williams of the United States Envelope Company; competition for the championship was intense and exciting between Howard Satterthwaite of the Satterthwaite-Cobaugh Company, Arthur B. Sherrill and Ellsworth Richards. Winning out by one stroke the first place in the Tennis match was won by President George K. Hooper, with R. J. Sheppard of the Peerless Manufacturing Company, runner up. In the quoit match, George E. Hebberly, of the Garrett-Buchanan Company, bested James Andrews, the old champion.

News of the Trade

Hooper Paper and Twine Company, Inc., 105 Church street, has been appointed exclusive distributor of Ta-Non-Ka Bond, made by Badger Paper Mills, Inc., Peshtigo, Wis. This Ta-Non-Ka is a well known inexpensive sulphite bond—is made in white and 10 colors—in all sizes and weights. It enjoys one of the widest ranges in colors of inexpensive sulphite bond. The main feature of it is that it is guaranteed to lie flat, to print and write, thus enabling printing machines to speed up work. Besides its wide range of colors it comes in linen and ripple finishes.

Representative Westerberg, of the Central Paper Company, Muskegon, Mich., was visiting recently in Philadelphia.

A movement in the paper trade which has just been launched by J. L. N. Smythe and the Paper Merchants, and which doubtlessly will be followed by the others, is an all-day Saturday closing beginning this coming Saturday and continuing for a 6-week period.

President Morgan H. Thomas and George A. Weaver, of the Garrett-Buchanan Company, have returned from their business conference in Chicago, where a program looking towards the stabilization of sales prices and costs on job lots of paper was under consideration.

Positive Control

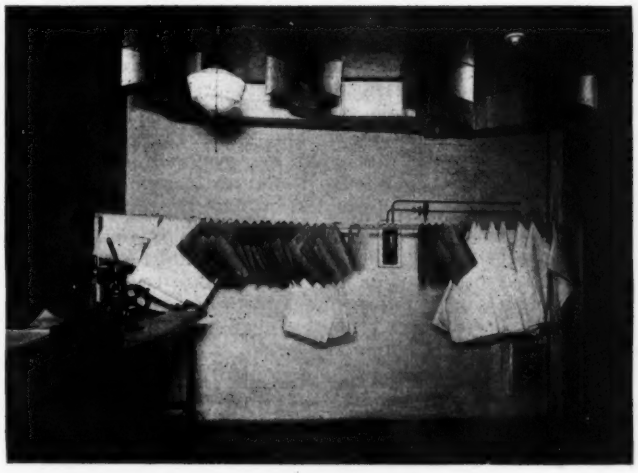
of both temperature and humidity for testing laboratories

View shows interior of typical insulated paper testing room.

Equipment is furnished in several sizes —all adequate to meet outside weather changes.

Accurate in results and simple to operate.

Economical to install and to maintain.



ROSS Conditioning Equipment

Copy of this Bulletin giving description and helpful data sent upon request.

Definite test standards are being insisted upon by purchasers of paper. Without positive control of humidity and temperature, test standards must be as irregular as the varying outside weather conditions. The Ross Air Conditioning System insures uniform conditions for testing at all times throughout the entire year. Standard or any intermediate conditions of relative humidities and temperature are easily maintained by a simple and dependable method of control. The equipment including the Ross Conditioning Unit is complete and compact and low enough in cost to enable any mill to maintain definite test standards.

We invite inquiries from any mill that is considering the installation of a testing laboratory.

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A Review of the Literature of Sizing

By E. Sutermeister[1]

Introduction

This review of the literature of sizing pertains chiefly to the rosin sizing of paper in the beaters, but it has been thought best to include some notes on surface sizing and on the use of other materials than rosin. It has been attempted to cover the field as completely as possible back to 1900 and to refer to the more important works before that date, but it is realized that omissions have probably been made inadvertently. It is also possible that errors have been made in quoting an article, as many of the original papers were unavailable, and dependence had to be placed chiefly on several of the abstract journals. Wherever possible the original papers have been consulted and it is hoped that errors are not too numerous.

Many of the papers reviewed discuss a number of different phases of the problem and instead of considering each of them as a unit it was thought best to break them up and arrange the subject matter under the various headings listed below. For this reason reference to a single paper may be found in more than one place in this review. As it has been found difficult to determine where some facts or statements belong they have been repeated in some cases, but if the reader does not find data where he expects, he should look under some of the closely allied headings. The classification under which the papers are arranged is as follows:

Historical and Literature Reviews.
Theories and Experimental Facts.
Testing and Properties of Rosin.
Size Making and Dissolving.
Size Analyses and Testing.
Alum.
Alum Substitutes.
Acidity or pH Values.
Water.
Beating.
Drying or Heating.
Calendering.
Sizing and Paper Permanence.
Sizing Tests and Rosin Determinations.
Special Processes and Patents.
Wax Sizing and Carbonate Filler.

It was hoped that a study of the literature would so correlate the various bits of information that many of the apparent contradictions would disappear, but this has proved true to only a minor degree. In many cases the abstract or translation is inadequate to permit close criticism of the work in question, and even when the original paper is available it is frequently found that it is not sufficiently detailed to show why its conclusions do not apply equally well to similar work done elsewhere. This is not because the recorded work was inaccurate, but because many of the variable factors were held constant during a series of tests and so not described in enough detail to assist in making allowance for their variation in other work.

The general impression gained during the course of this work is that many statements are made as facts which it is suspected are really personal opinions; at least not enough data are presented to enable one to judge under which classification they should be placed. In spite of the great amount of work which has been done on sizing there is still much uncertainty about the chemistry and physics of the process. This has been emphasized by many writers (Clark, Hatch, Olsen, Sutermiester, etc.), and still more by the unexpected results often obtained, even where the sizing operation is supposed to be well standardized. Wurster stated in 1878 that the methods of using rosin size varied in the different plants and that each one had to work out its own best conditions. This is still true today because the effect of different variables has not been worked out in sufficient detail to enable a calculation to be made of the resultant effect under any group of conditions.

The complexity of the problem and the difficulty of sizing investigations have been emphasized by numerous writers, and particularly by Sutermeister (Am. Dyestuff Reporter *13* 513, 584 (1924)) who listed and briefly discussed twenty three factors which might, and probably did, affect the results obtained; by Clark and Durgin (Paper, Feb 13, 1918) who outline a very comprehensive plan for experimental attack on the problem, and by Tucker (Paper Trade J. May 3, 1923) who discussed ten of the more common difficulties in sizing.

In the following pages temperatures are expressed as degrees Centigrade, pressures as pounds per square inch and speeds in feet, unless otherwise noted.

Historical and Literature Review

According to Wurster (Le Collage des Papiers 1878) the sizing agents used with papyrus were starchy in nature, while after cotton and linen came into use gelatin and alum were used, not as an addition to the pulp, but as a surface size. This caused paper making to be a seasonal occupation as the size dried too rapidly and cracked in summer, and too slowly and molded in winter. Olsen states (Paper Trade J. Oct. 11, 1928) that Illig, in his attempts to use other materials than gelatin, first experimented with milk percipitated with alum. While the paper was sufficiently sized to be used with writing ink, milk was not plentiful enough and he turned his attention to gums and resins. Wurster credits Illig with being the first to use rosin and alum in beater sizing in 1806, but states that he, as well as d'Arcet and Mérimée, used too little alum and so obtained only mediocre results. Canson's process, on the other hand, was well balanced in its proportions and he deserves as much credit as Illig for inventing beater sizing, in spite of the fact that he used bees wax instead of rosin.

Wurster states that in 1827 there were two processes available for paper makers, those of Canson and d'Arcet. The former used wax, as noted above, and the latter sized with rosin soap in the beater and surface sized the paper with glue. It would appear, therefore, that the actual use of rosin size in paper mills began about 1820 to 1830.

The following references are to articles which review the published work on sizing, either from the technical or historical point of view. Several of these are excellent from a general standpoint, while others relate more to special phases of sizing or closely allied subjects.

Heuser. (Wochbl, Papierfabr. *44* 1312 et seq. (1913)).

[1] Member TAPPI, chief chemist, S. D. Warren Company, Cumberland Mills, Maine.
Received February 15, 1933.

Includes a critical study of the work of Wurster, Remington, Neugebauer, Schwalbe, and Robsahm.

Anonymous. (Paper Trade J. *71* Nos. 20, 21 (1920)). A reading list.

Frano. (Mon. papeterie franc. *52* 443 et seq. (1921)). A review of theories and practice.

West. (Paper Trade J. Aug. 14, 1924). A reading list on rubber latex.

Ojala (Pulp Paper Mag. Can. July 31, 1924—from Pappers-och Travarutidskrift for Finland). Largely a review of the work of others. Favors the colloidal theory.

Lorenz. (Wochbl. Papierfabr. *56* 322 (1925)). Reviews the work of Teicher, Heuser, Lorenz and others with particular reference to colloid chemistry.

Oeman. (Svensk Pappers-Tid. *28* 534 et seq. (1925)). A summary of the work done by different investigators from Illig (1807) to 1925.

Rossman. (Paper Trade J. *86* No. 24, 45 (1928)). Review of U. S. latex patents.

(Ibid *89* No. 2, 61 (1929)). Review of Bakelite patents.

(Ibid *89* No. 20, 59 (1929)). Review of 38 patents on wax size.

(Ibid July 25, 1929). Review of U. S. patents.

Olsen. (Tech. Assoc. Papers. *12* 112 (1929)). An excellent review and summary of the sizing situation.

Rivise. (Paper Trade J. *88* No. 12, 62 (1929)). A brief review of artificial plastics in the paper industry.

Swift. (Paper Trade J. June 26, 1930 and Tech. Assoc. Papers *13* 232 (1930)). Reviews chiefly the work of Sieber, Zhereboff, Ivanov, Lorenz, Oeman, Herzberg, Hall, Hoffman and Edge.

Matagrin. (Papeterie *49* 542 et seq. Vols. 49-53 (1927-1931 incl.)). A monograph on waterproofing papers and boards. Includes 791 references.

Theories and Experimental Facts

Under this heading have been included the pro and con of the various theories proposed in explanation of the phenomena of sizing, and a considerable collection of experimental facts which relate to the theoretical considerations or which do not seem capable of easy classification elsewhere.

Regarding the effect of fibers on alum solutions it is quite generally accepted that Al may replace Ca in the fibers, but the evidence seems to indicate that it is a chemical rather than a colloidal action. The absorption of acid by fiber also seems to be closely related to the alkalinity of its ash. These conclusions are opposed by some who believe that fibers always show an absorption power for Al ions.

Evidence is presented to prove that different kinds of fibers react differently to the sizing process and there seems to be some relation between the pentosan content of the fiber and its ease of sizing.

Theories are offered in relation to the distribution of rosin on the fiber surfaces or in their interstices.

The chemical theories of sizing include those favoring free rosin, those claiming that aluminum resinate is the active agent and those which state that both substances are necessary. Closely bound up with these theories are facts and discussions relating to the composition of the precipitate produced on mixing size with alum. A few other notes along this latter line will be found under the heading "Alum". Many of these investigations were carried out in the absence of fiber.

Mention is made of the theory that rosin particles are surrounded and protected by a coating of aluminum hydroxide and some notes are made on the effect of heat on rosin-alum precipiates. More along this line will be found under "Drying or Heating".

The evidence for and against the colloid theory of sizing is reviewed at some length.

EFFECT OF FIBERS.

In studying the role of alum in sizing Schwalbe and Robsahm (Wochbl. Papierfabr. *43* 1454 (1912)) found that fibers decomposed $Al_2(SO_4)_3$ with the precipitation of $Al(OH)_3$ on the fiber. When 3 per cent of alum was used the precipitation was practically complete. In repeating this work under slightly different conditions Sutermeister (Pulp Paper Mag. Can. *11* 803 (1913)) found that soda poplar, sulphite spruce and rag stock could not decompose more than 1.95 per cent of their weight of $Al_2(SO_4)_3$ .18 H_2O. The amount of Al_2O_3 taken up did not exceed 0.3 per cent of the fiber weight in any case and it was not influenced by the amount or concentration of the alum solution used.

An anonymous writer (Papier-Fabr. *12* 963 et seq. (1914)) reported that from treating eight different fibers with dilute sulphuric acid in the cold it was found that no acid combined with the fiber, but that much might be neutralized by the basic materials which it contained. Dialysis of calcium carbonate which had been treated with alum proved that no soluble Al_2O_3 remained in the presence of $CaCO_3$, from which it appears that Al_2O_3 may accumulate within fibers which contain $CaCO_3$. From further work on fibers treated with dilute alum solution it was found that much Al_2O_3, but very little SO_3, was taken up, and here again the absorption was proportional to the CaO content of the fiber.

Tingle (Ind. Eng. Chem. *14* 198 (1922)) states that the observed withdrawal of Al_2O_3 from solutions of $Al_2(SO_4)_3$ in the presence of cellulose is due to chemical precipitation by the non-cellulosic impurities. He could show no adsorption by ordinary analytical methods and thinks there is reasonable doubt whether adsorption actually takes place.

Oeman (Papier-Fabr. *24* 49 (1926)) found that sulphite fiber took up Al_2O_3 from alum solution and that calcium passed into solution. The amount of Al_2O_3 absorbed depended on the calcium content of the fiber and was a minimum for ash-free filter paper. He thought that the Al probably replaced the Ca in the fibers. In another paper (Papier-Fabr. *24* 410, 451 (1926)) he expressed the opinion that under ordinary sizing conditions with slight acidity no important part is to be ascribed to precipitation of $Al(OH)_3$ on the fibers. This does not appear to be in agreement with his previous opinion (Papier-Fabr. *23* 725 et seq. (1925)) that when alum is used Al is adsorbed and makes the cellulose electropositive so that size readily combines with the fiber.

Edge (J. Soc. Chem. Ind. *48* 118T (1929)) states that cellulose readily exchanges adsorbed metals or salts for one another when the solution with which it is in contact changes. Ordinary pulps placed in an acid solution decrease the acidity of the solution, and acid-boiled pulps placed in an alkaline solution reduce its alkalinity. The decrease in acidity is generally nearly equal to the loss of alkalinity of the ash. The removal of alkali from solution causes no increase in the alkalinity of the ash, so alkali is not adsorbed as such. He thinks some organic acid in the cellulose is responsible for this effect. Rag pulps contain no appreciable amount of this acid, sulphate pulps a small amount and sulphite pulps considerable of it. After acid treatment rag pulp is easily washed neutral, while the others are persistently acid. This seems to indicate that sulphate and sulphite pulps contain some organic acidic material which is normally masked by the alkalinity of the ash-producing materials

present. Alum will dissolve about as much of the ash-producing material as sulphuric acid and the ash is increased, due to the exchange adsorption of alumina.

Roschier (Pappers-Travarutid. Finland *11* 304 (1929)) is opposed to the findings of Tingle and Oeman and claims that fibers always show an absorption power for Al ions. Previously (Papir-J. *16* 108 (1928)) he had expressed the belief that alum hydrolyzes to the colloidal hydrate, which is adsorbed by the fibers and fixes the size and color.

It has been noticed frequently that different fibers react to the sizing process very differently and it is possible that this is related in some way to their ability to absorb alumina.

Turner (Paper, July 5, 1922) states that rag fiber is harder to size than sulphite. Unbleached fibers and groundwood are harder to size than bleached pulps and fir fiber does not size as well as spruce. Oxycellulose makes the fibers size more easily. Edge (World's Paper Trade Rev. *89* 616 (1928)) confirms Turner's statement that cotton is much more difficult to size than wood pulp. The influence of fibers on sizing is recognized by Oeman (Svensk Pappers Tidn. *30* 651, 682 (1927)) who states, regarding certain of his results, that they hold only for the particular fiber used, and also by Olsen and Gortner (Paper Trade J. *87* No. 16, 47 (1928)) who made tests of the adsorption of rosin by paper stocks under different conditions and found that the kind and quality of the pulps used had considerable influence.

Chintschin (Bumazhnaya Prom. *11* 10 (1929) found that fiber containing less than 4.5 per cent of pentosans did not size well with 3 per cent of rosin when 40 per cent of it was in the free state, but if more than 4.5 per cent of pentosan was present the sizing was good. In order to impart good sizing to paper made from low-pentosan fiber in soft water he recommends adding alkali to the size milk. With such a fiber good results were obtained by using a size with 55 per cent free rosin to which was added 7 per cent of NaOH (on the weight of rosin) just before use.

Working chiefly with kraft fibers Harrison (Paper Maker & Brit. Paper Trade J. *83* Nos. 4, 5, 6, 158, 193. 208 T. S. (1932)) carried out a very comprehensive series of tests which showed marked differences between this stock and sulphite. The paper is almost impossible to condense, but a few of its interesting findings are that sulphite requires 1½ to 2 times the size that kraft does; hot calendering does not seem to injure the sizing of kraft, though it may with sulphite papers; with unbeaten sulphite the best pH for sizing was 3.8, while with kraft it was 5.8; for both fibers the sizing test increases with the time of contact of the fibers and size before adding the alum.

Distribution of Rosin

Zhereboff (Theory and Practice of Paper Sizing, Moscow, 1900, (In Russian)) is said in Paper Trade J. of March 27, 1924 to have concluded that there could be no filling up of the pores of the paper by the rosin because it is present in too small amount. In "post papers" it would amount to 6 per cent of the pore volume and in writing papers to 2 to 4 per cent. Neither does he believe that there can be any "wrapping" of the fibers in the finely divided rosin of white size because the total surface of the rosin present is only 5-7 per cent of the surface of the fibers to be covered. Nothwithstanding Zhereboff's views Klemm (Paper, Jan. 17 & 24, 1923 from Papierfabr.) believes that the fibers in the beater are covered with a perfect, uniform coat of size, which is retained after passing the paper machine. He cites the formation of films when solutions of size and alum meet and believes that if such films are formed on fiber surfaces they are resistant to mechanical influences and may even remain unbroken during beating. Excess of rosin and alum over that necessary to form a film acts only as a filler.

Arnot (Paper Maker's Monthly J. 63 142 (1925)) claims that sized fibers in the dry state under the microscope appear to be coated with minute globules or granules. When mounted in glycerol unsized fibers swell rapidly and sized fibers slowly, while the granular coating does not swell.

Chemical Theories

The chemical theory of sizing, as contrasted with the colloidal theory, is so closely related to the question of neutral or free rosin size and to the nature of the precipitate obtained on mixing size and alum, that it is necessary to consider these three subjects together.

According to Illig's ideas alum acted merely as an acid and precipitated the rosin in its original form. This is the basis of the free rosin theory and forms the foundation for the arguments in favor of size containing a high percentage of free rosin. With increasing knowledge of chemical reactions it came to be believed that the chief sizing agent was aluminum resinate and the free rosin theory was lost sight of until it was again brought to light in 1877 by Wurster. Since then the dispute has waged back and forth with the prevailing belief first on one side and then on the other, but with neither gaining any permanent or decided advantage. More recently still, they have both had to contend with the colloidal theory.

Wurster (Le Collage des Papiers. 1878) claimed that chemically equivalent amounts of sodium resinate and alum precipitated chiefly aluminum resinate and that this was decomposed by excess alum into free rosin and a basic aluminum salt. He found that sodium resinate and alum in the proportions to form aluminum resinate did not size paper. He also remarked that in dilute solutions most of the resinate is decomposed into free rosin before the alum is added, so aluminum resinate cannot be formed. While he says that size containing the most free rosin is the best, the example given shows only 15-20 per cent, which would not now be considered a high free rosin size.

Bray (Paper. Feb. 13, 1918) considers that high free rosin size is the best to use, but offers no evidence in proof of his claim. From his experimental work he found that 2/3 more alum was necessary to precipitate rosin in the presence of cellulose. With a rosin-alum ratio of 1:2 the maximum sizing was obtained with 3.5 to 4 per cent of alum.

Turner (Paper. July 5, 1922) considered the tendency at that time to be toward the use of low free rosin size.

Thiriet and Delcroix (Chimie & industrie, Spl. No. 508, Sept. 1925) claim that free rosin is the active sizing agent and that rosin is made into soap so as to obtain the required degree of subdivision. Free rosin in size is of advantage only as it reduces the alkali consumption and it does not give any better results than neutral size if the pH of the stock at the paper machine is 4.5 to 5.0.

Orlov (Chem. Zentr. 101, II, 2976 (1930)) favors high free rosin size, but states that the sulphuric acid formed when alum is incorrectly added is very harmful to the paper.

Edge (World's Paper Trade Rev. *89* 616 (1928)) states that a neutral size and one with 25 per cent free rosin are practically equal in value. In a later paper (World's Paper Trade Rev. *96* 1868 (1931)) he states that the precipitates obtained by adding alum and sul-

phuric acid to colloidal rosin solutions have ash contents and ether solubilities of the same order as those of precipitates from sodium resinate solutions under similar conditions.

Remington, Bowack and Davidson (J. Soc. Chem. Ind. *30* 949 (1911)) regard aluminum resinate as the true sizing agent and attribute to free rosin a very subordinate part. They studied aluminum resinate prepared by acting on neutral rosin soap with aluminum sulphate. The air dried, neutral aluminum resinate contained 4.56 per cent of Al_2O_3, while the theoretical for $Al_2(C_{44}H_{62}O_5)_3$ is 4.94 per cent. The dry compound is readily soluble in cold benzene and chloroform and partly soluble in ether and alcohol. Its melting point was 135-140 degrees. If rosin size and alum are used in equivalent amounts practically no free rosin acids are formed. Ether and alcohol split the compound into a soluble portion, poor in Al_2O_3, and an insoluble part, richer in Al_2O_3. The latter contains 6-10 per cent of Al_2O_3 and has no definite melting point, but softens and darkens above 300 degrees. It is insoluble in ordinary solvents, but chloroform converts it to a jelly. Drying the neutral aluminum resinate precipitate may cause dissociation into acid and basic aluminum resinates, since it is originally perfectly soluble in ether or alcohol. If the clear solution is heated, a precipitate is formed, which seems to be identical with the insoluble part of the dried aluminum resinate.

Heuser (Wochbl. Papierfabr. *44* 1312 et seq. (1913)) worked on sodium resinate and alum in the absence of fiber and concluded that no basic sulphates were formed. If equivalent quantities react a precipitate of neutral aluminum resinate is formed. (Al_2O_3 calculated, 5.50 per cent—found 5.94 per cent). There was no alumina in the filtrate. Immediately after drying at 80 degrees it is soluble in ether, chloroform and benzene, but not in alcohol. The aluminum resinate does not show any definite melting point, but begins to turn brown and decompose at 115 degrees. If it stands in a desiccator 14 days it becomes incompletely soluble in cold ether. Its solution in either alcohol or ether decomposes on boiling. By extraction of the neutral resinate with absolute alcohol never more than 58.66 per cent was dissolved and all the Al_2O_3 remained in the residue, which was insoluble in ether.

Sieber (Zellstoff Papier I 15, 65, 139 184 (1921) II 99, 134 (1922)) states that aluminum resinate, once it is isolated, is rather stable toward $Al_2(SO_4)_3$. The precipitation product is unstable and when freshly made is soluble in ether; when dried it is only 70 per cent soluble.

Oeman (Papier-Fabr. *24* 410, 451 (1926)) also found that freshly prepared aluminum resinate, dried without heat, was completely soluble in ether, benzene and carbon tetrachloride, but insoluble in alcohol, which decomposed it, dissolving only a portion of the free rosin acids. Heat also decomposed it and then ether dissolves only part of the free acid, leaving aluminum resinate undissolved. Acidity equal to a pH of 3.5 liberates considerable free acid. Sulphite pulp also makes it partly insoluble in ether. An ether solution of aluminum resinate is capable of sizing paper; a suspension of precipitated neutral aluminum resinate also has sizing properties, but its results are inferior to those when part of the free rosin is liberated with alum or sulphuric acid.

Edge (World's Paper Trade Rev. *92* 1974 (1929)) found that 2 per cent of dry, precipitated acid aluminum resinate added to a moderately "wet" pulp at a pH of 5.0 in the presence of a little alum gave hard sized paper. The same effect was obtained with commercial aluminum resinate, but normal aluminum resinate, purified with ether, did not give hard sizing. Precipitated calcium resinate in the presence of a little alum gave moderately good sizing, though not as good as the acid aluminum resinate.

Zhereboff (The Theory and Practice of Rosin Sizing. 1900. (In Russian)) disagrees with Wurster's theory that all rosin is precipitated as free rosin in the presence of excess alum. He states that aluminum resinate is present in the beater, on the wire and in the paper itself, and that the accompanying free rosin amounts to only 10-60 per cent of the total used.

Griffin (J. Am. Chem. Soc. *27* 258 (1905)) found that paper which had been treated with hydrochloric acid, washed and air dried, was very absorbent before any rosin had been extracted and from this evidence concluded that free rosin was not an effective sizing agent. Paper made with alum but no size, and paper in which the size was precipitated by sulphuric acid were unsized, but if $Al(OH)_3$ was added to the stock in which the size had been precipitated by sulphuric acid the paper was better sized, even though the $Al(OH)_3$ was only stirred in by hand for a few minutes. From this work he concluded that cellulose hydrates do not seem to combine directly, to the extent of being sized, with either free rosin acids or alumina, and that alum precipitates the size as a resinate and paper is sized by the resinate, the rosin and the alumina separately.

Neugebauer (Z. angew Chem. *25* 2155 (1912)) also believed that sizing was due to both free rosin and basic aluminum resinate. He found that alum reacted with neutral sodium resinate to form a precipitate of free rosin and basic aluminum resinate. The greater the excess of alum the higher the per cent of free rosin and the more basic the aluminum resinate, but the maximum free rosin was 41 per cent, even when twelve times the theoretical amount of alum was used. Temperature had no effect on the composition of the precipitate, but higher temperature makes it less voluminous.

DeCew (Paper Trade J. Sept. 28, 1916) considers that free rosin size is an acid resinate of the alkali metal, and that an acid resinate of aluminum is the important sizing agent. This is formed from a neutral resinate only when a large excess of alum is added. The necessity for alum is not so much to form the acid resinate as it is to precipitate the rosin in a more colloidal state than by other precipitants.

Aschan (Chem. Zentr. *90* II 190 (1919)) states that the sizing deposit consists of a mixture of aluminum resinate, free rosin acids and a little free $Al(OH)_3$. The free rosin acids can be extracted with ether. An excess of the free acid is not an effective substitute for aluminum resinate.

Arnould (Papier *23* 35 (1920)) believes that with neutral size the alum first reacts to form aluminum resinate, which is then partly or wholly transformed into free rosin by the excess alum.

Guerity (Papeterie *45* 834 (1923)) claimed that under conditions existing in the mill no aluminum resinate was precipitated in the paper. He based his conclusions on the ash shown by the paper before and after extraction with ether, or from the results of extracting first with 85 per cent alcohol and then with ether and ashing the latter extract. Precipitation tests using 50-400 grams of $Al_2(SO_4)_3$ per 100 grams of sodium resinate gave a mixture containing 31-41 per cent of free rosin and 3.8-5.25 per cent of Al.

Zhereboff (Bumazhnaya Prom. *2* No. 4, 391 (1923)) claims that if alum is added in concentrated solution aluminum resinate can be formed in the beaters.

Uzac (Rev. gén collöides *4* 257 (1926)) rejects Klemm's theory of the action of heat in drying paper and believes that the higher temperature favors the formation of basic resinate and its complex with free acid. Since the extraction of sized paper with alcohol removes free rosin and reduces sizing it seems to show that free rosin has sizing power. Uzac's conclusion with regard to the action of heat is opposed to that of Arledter (Papier Ztg. *32* 773 (1907)) who believed that aluminum resinates were precipitated by the alum and that these were decomposed by heat, the rosin acids melting and filling the pores of the paper.

Roschier (Acta Chem. Fennica *2* 48 (1929)) states that the acidity during sizing determines whether the sizing is done by free rosin or aluminum resinate. He considers the bound rosin very important, but that free rosin and Al ions are less important than generally thought. In a second paper (Papier-Fabr. *27* 444 (1929)) he expresses the opinion that aluminum resinate, $Al(OH)_3$ and free rosin all play an important part in sizing and that free rosin and adsorbed Al ions alone cannot account for sizing. He found the degree of sizing to be independent of the pH of the stock caused by the adsorption of free rosin, and that it was impaired, rather than improved, by free $Al(OH)_3$.

Schwalbe (Papier-Fabr. *21* 477 (1923)) believes that $Al(OH)_3$ coats the rosin particles, prevents them from fusing together on the drying cylinder and protects them from subsequent action of light and air. Good sizing cannot be obtained by using rosin and H_2SO_4, but is possible when alum replaces the acid. He finds that rosin precipitated in paper by H_2SO_4 becomes more insoluble in petroleum ether when exposed to light, than rosin which has been precipitated by alum.

Colloid Theories

Sieber (Zellstoff Papier. *1* 15, 65, 139, 184 (1921); *2* 99, 134, (1922)) offers numerous interesting observations and theories regarding the colloidal aspects of rosin sizing, but most of his tests were made with rosin suspensions prepared by dissolving rosin in alcohol and then pouring it into water. He shows from tests on six halfstuffs that they were able to absorb only a very small amount of rosin, not over 0.18 per cent in any case. The absorption was greater with beaten pulps but even where as much as 0.56 per cent was taken up the pulp was not sized to writing ink. No diffusion of the rosin through the fiber could be demonstrated, nor did there seem to be any adsorption of rosin by clay.

Stockigt and Klinger (Papier-Fabr. Fest-u Ausland-Heft 1921 50-60) found that paper could be sized with colloidal rosin but only with the use of alum as an electrolyte. They considered that the process took place in two stages, first, the formation of an adsorption compound of rosin and aluminum hydrate and, second, the adsorption of this compound by the fiber.

Lorenz (Wochbl. Papierfabr. *53* 4542 (1922)) believes that aluminum resinate is not formed in the beater because the size is in the colloidal, rather than the ionic, state. The action of alum is that of a flocculating agent. Other colloids, as glue, casein, etc., may flocculate or peptize the size according to how they are used. Anions, OH, Cl, SO_4, have no peptizing action. Alum acts to coagulate by the effect of its actions and also by neutralizing the OH ions by the acid formed by hydrolysis. As all the Al ions are converted to $Al(OH)_3$, its flocculating action ceases and any further action depends on H ions. Coagulating agents free from Al do not give permanent sizing, so Al seems to be necessary.

Heuser (Svensk Pappers-Tidn. *26* 114, 202 (1923)) points out deficiencies in the theories of Illig and Wurster and upholds the colloidal theory that negatively charged cellulose adsorbs the positively charged $Al(OH)_3$ and then the negative colloidal rosin acid. A colloidal sodium free rosin acid will not size paper until a solution of alum is added, or a colloidal solution of $Al(OH)_3$. Sizing proceeds when $Al(OH)_3$ is replaced by $Fe(OH)_3$ or $Cr(OH)_3$ and is termed electrolytic coagulation. The first stage is the production of a positively charged coagulated substance from the rosin acids and $Al(OH)_3$; the second stage is the adsorption of this substance on the negative cellulose; and the third stage takes place on the driers at a temperature of 70-80 degrees, by a sintering process before the water in the web falls below 50 per cent.

Lorenz (Papier-Fabr. *21* 221 et seq. (1923)) submits a deeply theoretical study on the colloidal phases of rosin sizing. He states that with rosin acid in the form of ions, alum would be able to form aluminum resinate. If the particles are of colloidal proportions this might take place on the surface, but not with those inside the rosin complex. (A very similar paper by Ostwald and Lorenz appeared in Kolloid-Z. *32* 119, 195 (1923)).

Thiriet and Delcroix (Chimie & industrie, Spl. No. 567 (May 1924)) propose the theory that over a certain range of pH rosin and cellulose have electric charges of opposite sign, so that sizing is possible by mutual attraction. Outside this range the electrolyte is too acid or too basic the rosin and cellulose are charged similarly and sizing is impossible. Proper sizing conditions are obtained when the backwater gives the same color with methyl red and sodium alizarinsulphonate.

Zhereboff (Bumazhnaya Prom. *2* No. 4, 391 (1923)) adheres to the chemical theory as opposed to the colloidal theory of Sieber, Lorenz, Haüg, Stockigt and Klinger, and points out that the size solution is colloidal, but the active sizing acids are crystalloids. If the union of $Al(OH)_3$ and rosin is merely adsorption their proportions should vary but the results of Remington, Fast, Heuser and Sieber show nearly the same amount of Al_2O_3, viz 4.78 to 5.69 per cent, from which it seems that rosin enters into chemical reaction. The solubility of only about 60 per cent of the rosin-alum precipitate in alcohol, obtained by both Sieber and Heuser, also points to chemical union. The rapidity of precipitation by alum, regardless of concentration, is opposed to the colloid theory. Since it is possible to size paper using H_2SO_4, Lorenz' assertion that positively charged alumina is indispensable is not supported by experience.

Papers dipped in alcoholic solutions of that part of the rosin which had high ether numbers were unsized when containing 6 and 9 per cent of rosin, but 10 years later were found to be well sized.

Regarding precipitation in the beater Lorenz (Wochbl. Papierfabr. *56* 962 et seq. (1925)) concludes that the Al ion exerts a coagulating effect over all ranges of concentration; that with a high concentration of rosin, especially with a large amount of alkali, a portion of the former is carried with the insoluble $Al(OH)_3$ formed in the beater; and that the colloidal coagulation of the rosin-$Al(OH)_3$ adsorption compound depends on the relative concentrations of the rosin and $Al(OH)_3$.

Oeman (Svensk Teknisk. Tid. *22* 176 (1925)) claims that sulphite pulp in weakly acid solution is positively charged, the corresponding negative charge being in the water as SO_4 ions. In a weakly alkaline solution (pH 9.5) it is negatively charged. When pulp is subjected to acid treatment its isoelectric point is on the acid side

of neutrality (pH 5.5-6.0). If OH ions are added its isoelectric point is displaced toward the alkaline side. Sulphate pulp yielding more OH ions than sulphite pulp, has its isoelectric point on the alkaline side. Both fibers are amphoteric substances. In sizing the negative rosin particles are attracted by the positive fibers, the positive charge of the latter being due to adsorption of Al ions and to the slight acidity of the alum solution. In another paper (Papier-Fabr. *24* 49 (1926)) he states that if the fibers have been treated with an alum solution and the dispersion of the rosin solution is sufficiently high the presence of alum in solution is not necessary for rosin absorption, as it is taken up directly by the treated fibers. In still another paper (Svensk Pappers-Tidn. *29* 82 (1926)) he discusses two theories, hydrolysis into colloidal $Al(OH)_3$ and the taking up by the fibers of positive Al and the subsequent addition of negative rosin. He favors the second theory as more logically explaining the differences in the amount of rosin required in different plants for equal sizing. (See also Svensk Pappers-Tidn. *30* 651, 682 (1927)).

Kanamaru (J. Soc. Chem. Ind. (Japan) *34* 78 (1931)) studied the potential difference existing at the fiber interface. As both fiber and rosin are negatively charged very little rosin is fixed in the absence of alum. Addition of alum results in the fixation, partly mechanical, of rosin-$Al(OH)_3$ aggregates. Under ideal conditions these aggregates should completely neutralize the charge on the fiber surfaces.

Strachan (Paper Maker and Brit. Paper Trade J. *82* No. 3, 4, 5 (1931)) believes that there is a formation in the fibers of a semipermeable membrane of alumina which prevents diffusion of rosin into the fiber and that positively charged alumina is adsorbed on the negative fiber surface and in turn adsorbs negative rosin, thus forming a bond between the rosin and the fiber surface. This theory does not, however, preclude the formation of aluminum resinate, although the physical reactions are probably stronger than the chemical ones.

(*To be continued*)

Phoenix Paper Mills To Reopen

The Phoenix Paper Mills, Battenville, N. Y., have been sold and will probably be started soon. A press dispatch says that: "Evidence that Battenville is again to have a papermaking industry is seen in the fact that the plant machinery is being cleaned and overhauled, presumably with an idea of opening soon.

"Several weeks ago the mill was sold in foreclosure proceedings brought by Atty. Henry L. Russell of Greenwich. Mr. Russell made the sale as trustee for a group of investors holding a mortgage on the property. The attorney has declared that there have been negotiations for the sale of the mill to persons intending to operate, but that he is not ready to give out particulars."

R. W. McCorkindale To Retire

HOLYOKE, Mass., July 24, 1933.—Roger W. McCorkindale retires August 1 from the Parsons Paper Company. Mr. McCorkindale has been associated with the company for the past 30 years. After graduation from the Holyoke high school, he entered the mill and learned the paper industry under the direction of his father, the late William McCorkindale. He became superintendent ten years ago when his father retired. Mr. McCorkindale has been in poor health for the past six months. He and Mrs. McCorkindale expect to spend the next month in Maine.

Waste Material Code Committee

A general co-ordinating Code Committee of the National Association of Waste Material Dealers has been appointed with Harr. R. De Groat as chairman. The committee, whose names are below met July 20 to consider a tentative code, final action on which will be taken at the Convention of the Association at Chicago August 7, 8 and 9.

Nat E. Berzen, Nat E. Berzen, Inc., New York; Milton Birkenstein, Wisconsin Rag and Metal Company, Milwaukee, Wis.; David Charak, Federal Paper Stock Company, St Louis, Mo.; H. H. Cummings, Wm. H. Cummings & Sons, New York; David Feinburg, David Feinburg Company, Medford, Mass.; Ezra Frankel, Frankel Bros. & Co. Rochester, N. Y.; David Galloway, David Galloway, Inc., New York; John Garvan, P. Garvan, Inc., Hartford, Conn.; Maurice Goldstein, American Wool Stock Corporation, New York; David Golub, Charles Harley Company, San Francisco, Cal.; Samuel Greenfield, Samuel Greenfield Company, Inc., Buffalo, N. Y.; E. J. Keller, E. J. Keller Company, New York; George Lange, Letellier-Phillips Paper Company, New Orleans, La.; Nathan Leshner, The Leshner Corporation, Hamilton, Ohio; J. W. Long, S. Birkenstein & Sons, New York; J. M. Maher, Pennsylvania Wood and Iron Company, Buffalo, N. Y.; J. A. Marchant, Philipp Brothers, Inc., New York; Herman Muehlstein, H. Muehlstein & Co., Inc., New York; Wm. J. McGarity, Penn Paper and Stock Company, Philadelphia, Pa.; E. E. Oury, Cline & Bernheim, Nashville, Tenn.; Carlton B. Overton, Castle & Overton, Inc., New York; Joseph Schapiro, S. Shapiro & Sons, Baltimore, Md.; I. L. Scheinman, Sheinman-Neaman Co., Pittsburgh, Pa.; Hugo Simon, Hugo Simon, New York; Frank Schmutzer, Frank Schmutzer, New York; J. V. Spachner, Chicago Mill Paper Stock Company, Chicago, Ill.; Stuart Sutphin, The I. V. Sutphin Company, Cincinnati, Ohio; Clarence B. White, White Bros. Smelting Corporation, Phila., Paul J. White, Great Eastern Packing and Paper Stock Corp., New York.

Waste Material Industry to Adopt Code

Responding to the call of Charles M. Haskins, its managing director, the members of the National Association of Waste Material Dealers, Inc., will travel from all over the country to attend the Code Convention in Chicago on August 7, 8 and 9. At this meeting will be adopted the code for the industry, which last year handled more than $1,000,000,000 worth of the waste products of industry.

Unlike the greater number of the codes which have been submitted to Washington it is planned that the code of the Association is to be drawn up on a cooperative basis so that the members of the industry may continue in business on a fair basis that will assure adequate profits without victimizing any of the industries which depend upon it.

The National Association of Waste Material Dealers is more than twenty years old and is expected to create the code under which this industry, in which more than 500,000 people are employed, will be able to do its part in assisting in the governmental recovery movement. The members of the Association include the representatives of every branch of the waste material industry and the great industrial organizations of the country are all active.

L. L. Brown To Make Improvements

L. L. Brown Paper company of Adams, Mass., manufacturer of highgrade bond and ledger papers, is preparing to build new concrete and steel foundations for its beater room. It is understood that one new beater will be installed as soon as this improvement is completed.

Obituary

William F. Hazel

WATERTOWN, N. Y., July 21, 1933.—William F. Hazel, aged about 55, for the past several years general superintendent of the Glens Falls division of the International Paper Company, died there last Sunday night. He had recently undergone a serious operation.

Mr. Hazel was well-known to the paper trade of the North Country, having been located here about ten years with the International Paper Company and the St. Regis Paper Company.

About 1909 he came here from the Hudson River Division of the International to assume the general superintendency of the Watertown Division, which was flourishing at that time with three mills at Glen Park and one on Sewall's Island.

After remaining with the company here for eight years he resigned in February, 1917, to accept the superintendency of the Deferiet mill of the St. Regis Paper Company. In September of the same year he was promoted to the general superintendency of the company, being given charge of the mills at Black River and Herrings, in addition to the big mill at Deferiet.

In June, 1919 he resigned as general superintendent of the St. Regis, his duties being temporarily taken over by J. J. Warren. For the next two years he was connected with the Cushnoe Paper Company of Augusta, Me. After that Mr. Hazel was for some time traveling representative of the Orr Felt and Blanket Company, of Ohio, manufacturers of paper mill felts, but a number of years ago left that corporation to return to the International Paper Company as general superintendent of the Glens Falls Division. There he has since been, residing in Glens Falls.

For several months he had been in ill health and recently submitted to an operation to correct the trouble. Instead of improving, however, he became worse and death ensued Sunday night. Telegraphic announcement of it was received here Monday from his widow, Mrs. Julia Hazel by Mrs. Edwin E. Martin who, with Miss Florence Carter, will attend the funeral at Glens Falls Wednesday.

Mr. Hazel was well known to the paper manufacturers, mill executives and most of the pulp and paper mill operatives in the Black River Valley and to many in the North Country. He was an able executive and performed tactful service for the St. Regis in settling a strike of employees when he took charge of its mills.

He is survived only by his widow.

Herbert D. Wood

PHOENIX, N. Y., July 20, 1933.—Herbert D. Wood, aged 80, founder of the Phoenix Toilet and Paper Manufacturing Company and one of the most prominent citizens of this village, died Friday afternoon, July 14, at his home on Main street.

Mr. Wood had enjoyed good health until recently. Several months ago he suffered a fall at his home, but was able to be about until January, when his condition grew serious. He had been confined to his bed during the past four weeks, and Wednesday began to sink into a state of coma, failing rapidly until his death.

In 1886 there was but one paper mill running here, known as the Charles Avery mill, and this Mr. Wood purchased, becoming one of the pioneers of that industry in Northern New York. He reorganized the company, changing the name to the Phoenix Toilet and Paper Manufacturing Company and continued his activities in the plant until his retirement in 1918, when he was succeeded by his two sons Irving S. Wood and J. Howard Wood. The latter was killed by the explosion of a tank in the basement of his home in 1924.

Mr. Wood was prominent in Masonic circles. He was a member of Callimachus Lodge 369, F. and A. M., Phoenix; Oswego River chapter; Lake Ontario commandery, and Media temple. He was a staunch Democrat.

Besides his widow he is survived by a son, Irving S. Wood; two brothers, Charles Wood of Syracuse and George C. Wood of Phoenix; two sisters, Miss Frances Wood and Mrs. Charles Hess of this village; three grandchildren, J. Howard Wood, Jr., Irvin S. Wood and Miss Nancy Wood; seven nieces and six nephews.

William J. Stiles

RICHMOND, Va., July 20, 1933—William J. Stiles, retired superintendent of the Standard Paper Manufacturing Company, Richmond, passed away on Friday, July 14, at St. Lukes Hospital here.

Mr. Stiles, who was born in Chesterfield County, Va., on May 26, 1857, came to Richmond as a young man and was very instrumental in starting several of the now prominent industrial plants of the city. He was a mechanical engineer of great ability, and applied to his work a degree of common practical sense that put his services in demand by several companies. His early work consisted of the erection of the Richmond Brick Manufacturing Company plant at Clayville, Va., and in the erection of the Hollywood mill of the Albemarle Paper Manufacturing Company, with whom he was connected for several years.

Mr. Stiles was the engineer in charge of the erection of the first mill of the Standard Paper Manufacturing Company in 1901, after which he became superintendent of the No. 1 mill and later served as general superintendent of all mills until his retirement two years ago.

In matters of plant construction Mr. Stiles was often consulted by outside interests and always gave freely of his recommendations and advice, without compensation. His high character and impeccable honesty brought him a host of friends.

His funeral was held July 16 at Central Methodist Episcopalian Church, with burial in Forest Lawn Cemetery.

Harmon Paper Mill Sold

WATERTOWN, N. Y., July 24, 1933.—The mill, water power and properties of the Harmon Paper Company of Brownville has been purchased by Lester G. Boysen, of Syracuse, who plans to start operation within the next month or six weeks in the manufacture of specialty papers.

Mr. Boysen has already assumed charge, and through his attorney, D. Eaton Alvord, Syracuse, plans are now being made for the organization of a corporation, of which he is to be the active head. The personnel of the corporation is not yet known, nor is the amount of the capitalization known, but it will undoubtedly be at least $150,000.

Mr. Boysen has already taken up his residence in this city and is preparing to make such repairs and improvements as the mill requires for the manufacture of specialty papers. It was said that no alterations of machinery would be necessary as the plant has produced colored specialties in the past, although for many years its chief product was a high grade hanging paper.

The mill has been out of operation for about four years because of depressed market conditions, and will be started up on one of its two machines, running on the lower grade specialties at first. It is not likely the second machine will be started for about six months.

Operation of the mill reflects marked improved conditions in the paper industry and means the employment of at least a half hundred men within the next few weeks.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Kalamazoo, Mich.—The Kalamazoo Paper Company has authorized an expansion and improvement program at mill, including installation of new equipment. It is understood that one of the large paper-making machines at the plant will be replaced with a new unit and auxiliary machinery. Entire project is reported to cost about $125,000.

Rome, Ga.—The Tubize Chatillon Corporation, Rome, manufacturer of cellulose rayon products, will carry out a sizable expansion program at local mill, in addition to work recently referred to in these columns. A number of new units will be built for additional pulp storage and distribution, viscose preparation and other operating service, as well as extensions in power plant. Considerable new machinery will be installed. Entire project is reported to cost over $2,000,000, with equipment. Work is scheduled to begin at early date. General contract for buildings has been let to the Fiske-Carter Construction Company, Greenville, S. C. J. E. Sirrine & Company, Greenville, are architects and engineers.

Brooklyn, N. Y.—The General Carton Corporation, recently organized by Harold M. Harkavy, 618 Eastern parkway, Brooklyn, and associates, with capital of $50,000, and 200 shares of common stock, no par value, plans operation of local plant for the manufacture of paper boxes and containers, folding cartons, etc.

Detroit, Mich.—The Wolverine Waste Paper Company, Adelaide street, is planning rebuilding of storage and distributing plant, recently damaged by fire with loss reported at close to $18,000.

Nashville, Tenn.—The Mead Corporation, Dayton, Ohio, has concluded negotiations for the purchase of the paper box manufacturing business of the Tennessee Extract Corporation, Knoxville, Tenn., and will take over property at once. Building and equipment will be improved, and unit placed in operation at early date. General expansion in output is planned.

Monroe, Mich.—The Consolidated Paper Company has recently advanced production schedule and has made additions to working quota. Improved manufacturing basis will be continued for an indefinite period.

New York, N. Y.—Comet Carton and Novelty Company, Inc., recently organized, is said to be planning early operation of local plant for manufacturing of paper boxes and containers. Oscar Meltsner, 4217 16th avenue, and Joseph M. Margolis, 1492 East 33rd street, both Brooklyn, N. Y., are interested in new company.

Eaton, Ind.—Ball Brothers Company, Paper Mill Department, Muncie, Ind., has concluded arrangements for the purchase of the former Eaton paper mill, Eaton, recently the property of the United Paperboard Company, Inc., 171 Madison avenue, New York, N. Y., which has been idle for about three years. The new owner will make improvements in building and equipment, and plans to resume operations at early date for the manufacture of boxboard specialties for use in packing fruit jars for shipment. A sizable working force will be employed. The plant will be operated in conjunction with paper mills of the purchasing company at Muncie and Noblesville, Ind.

Marerro, La.—The Celotex Company, Chicago, Ill., operated under direction of Hobart P. Young, receiver, is maintaining good capacity at local wallboard mill, giving employment to large working force. Since last May, the plant and company have been operating at a profit, and further advance in output is planned in near future.

Middletown, Ohio—The Fairbanks Fiber Box Company, Yankee road, is awarding miscellaneous contracts for completion of new addition to plant, previously referred to in these columns, and will soon occupy the unit for operating service. It will be one-story, 75 x 130 feet, reported to cost about $25,000, with equipment. An award for boiler and stoker, with accessories, has been made to the Brownell Company, Dayton, Ohio. Hillsmith & Co., 108 East Third street, Dayton, are engineers.

New York, N. Y.—The Union Bag and Paper Corporation, Woolworth Building, is running on a full time production basis at its different paper mills and bag-manufacturing plants, giving employment to close to normal working quota. The paper mill at Hudson Falls, N. Y., reopened early in June, is maintaining regular production schedule.

High Point, N. C.—The Carolina Paper Box Company, Inc., recently chartered by W. R. Davis, High Point, and associates, with capital of $100,000, has leased local building, and will equip for new plant for manufacture of paper boxes and containers. It is proposed to provide facilities for initial output of about 30,000 box units per day, having the plant ready for service some time in August. Mr. Davis will be president of new company. A. M. Carroll, Burlington, N. C., will be an official of the company.

York, Pa.—The York Wall Paper Company, Linden avenue, is running on full capacity schedule at local plant, and has recently added to working quota, following adoption of 40-hour working week. It is expected to hold to present production basis for an indefinite period. Earl G. Kegler is general manager.

Newark, Del.—The Continental Diamond Fiber Company has increased its working force by about 50 per cent during the past two months, and employment is now being given to about 250 persons at the mill. It is expected to maintain current schedule for some time to come.

Bathurst, N. B.—The Bathurst Power and Paper Company has adopted a full time production schedule at local mill for the first time in several years, and heavy shipments of newsprint are being sent to England. Improved operating basis will be continued indefinitely.

New Companies, Etc.

Buffalo, N. Y.—Craft-Board, Inc., Buffalo, has been incorporated with capital of $25,000 and 3,500 shares of common stock, no par value, to manufacture paperboard and wallboard products of various kinds. The incorporators include John J. Finerty, Lake Shore road, Derby, N. Y., and Clarence K. Porter, Central avenue, Lancaster, N. Y.

New York, N. Y.—The Moon & Herman Hat Box Company, Inc., has been organized with capital of 600 shares of stock, no par value, to manufacture paper boxes and containers of various kinds. The incorporâtors are Samuel Margoles and Charles Poll, 103 Greene street.

Indianapolis, Ind.—The C. P. Lesh Paper Company has been incorporated with capital of $125,000, to deal in paper goods. New company will take over and succeed to organization of same name at 121 Kentucky avenue.

Detroit, Mich.—Dick Shannon, Inc., has been incorporated with capital of 10,000 shares of stock, no par value, to manufacture and deal in paper goods of various kinds. New company is headed by R. L. Shannon, 806 Guaranty Building, Detroit.

Chicago, Ill.—The Quality Bag and Paper Company, 620 Orleans street, has been incorporated with capital of $20,000, to manufacture and deal in paper bags and containers. The incorporators include F. and J. J. Farland, and H. Warner. New Company is represented by F. R. Hartman, 176 West Adams street, city.

New York, N. Y.—Bagpak Machinery Corporation has been incorporated with capital of 200 shares of stock, no par value, to manufacture bag-making machinery and parts, as well as paper bags, containers, etc. The incorporators are C. R. D. Meier, R. L. Weldon and J. S. Snedden, all of 220 East 42nd street, New York.

Heveatex Corp. Serving Paper Field

The growing demand for latex in industry and particularly in the paper field, has made it necessary for the Heveatex Corporation to enlarge its facilities to handle this increased volume of business. More than 50,000 feet of floor space has been added, assuring manufacturers of a constant supply of normal, concentrated or processed latex.

Unusual interest is being displayed in a new departure by the Heveatex Corporation whereby its specialized facilities and experience are provided for working out through all the experimental stages, complete development projects utilizing latex. The completed process is delivered to manufacturers ready to set up for production.

For the development of new products, or for the improvement of old products, this arrangement offers exceptional opportunities.

The main office and plant of the Heveatex Corporation is situated at Melrose, Mass. with branches located in New York, Akron and Chicago.

H. J. Buncke Goes With Oxford Paper Co.

The Oxford Paper Company has announced that as of June 1, 1933, Mr. Harry J. Buncke has joined their organization at Rumford as chief engineer. Mr. Buncke, who graduated from Columbia University and received his Master's Degree from the University of Maine, has been associated with engineering work in the pulp and paper industry for sixteen years. For the past five and one-half years Mr. Buncke has been chief engineer for the Abitibi Power and Paper Company with offices at Toronto. Fred J. Latham who up to the present has been the chief engineer of the Oxford Paper Company will act as consulting engineer for the Oxford Company.

Paper Stock Code Revised

At a special meeting of the Executive Committee of the New York Association of Dealers in Paper Mills' Supplies, Inc., held Tuesday afternoon, July 18, 1933, definite steps were taken for the organization of the paper and woolen mills' supplies industry into an association to be known as the Eastern Association of Dealers in Paper and Woolen Mills' Supplies.

The permanent committee on Organization and Code of Fair Competition submitted its draft of the revised code, which supplants the code filed with the National Industrial Recovery Administration on June 28, 1933.

The revised code, which was unanimously approved by the committee, will be submitted to the membership for ratification at a meeting to be held in the early part of next week.

The new code provides that no employee shall be employed in excess of 40 hours in any calender week and recognizes the employee's right to organize and bargain collectively. The minimum wage to be paid by employers in the industry is fixed at $15.00 for male and $12.00 per week for female labor.

Chauffeurs' minimum wage to be $30.00 per week. Full compensation insurance for every employee and full liability and accident insurance on trucks, whether owned or hired, are required by the code.

False packing or the substitution of an inferior grade of material, defamation of competitors, commercial bribery, interference with the performance of contracts, selling of goods below costs, issuance of fictitious or misleading price quotations, submission of false claims or bills of lading, failure to give credit for overweights are defined as unfair trade practices and condemned by the industry.

The new organization takes in the Eastern area of the United States and includes the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia and the District of Columbia.

The Eastern Association will have five Chapters, to be known as the Pittsburgh-Buffalo, Baltimore, Boston, New York, and Philadelphia Chapters.

The divisions of the Eastern Association will consist of the following: Waste Paper Division, New Cotton Rags Division, Old Cotton Rags Division, New Woolen Clippings Division, Old Woolen Rags Division, Old or Scrap Rope, Bagging, etc., and Jobbers and Importers Divisions.

Any person, partnership, firm or corporation engaged in the paper and woolen mills' supplies industry is eligible to membership.

No initiation or entrance fees are proposed, but for the present, the annual dues for membership in the Eastern Association will be $20.00 for each person, partnership, firm or corporation.

The temporary officers of the Eastern Association of Dealers in Paper and Woolen Mills' Supplies are as follows: Harris Goldman, president; Lawrence W. Giove, vice-president; Walter H. Martens, treasurer; Alfred J. Moran, secretary.

By unanimous vote, Charles J. Browne, long a leading figure in the industry and known throughout the East for his untiring efforts to have the rates on paper stock and other paper-making materials reduced in Official Classification territory, was appointed as permanent managing director of the industry with full power to represent it in Washington, D. C., and co-ordinate the industry.

Headquarters of the Eastern Association will be located at 62 William street, New York, where completely furnished offices approximating 1200 square feet, will be maintained.

New York Trade Jottings

Vortex Cup Company, New York, reports that sales of drinking cups, soda cups and sundae dishes, continues to show the same improvement thus far during July that was shown in June, when sales ran 30 per cent ahead of June a year ago.

* * *

Sterling Mill Supply Company, of 146 Wooster street, New York, has entirely rebuilt its warehouse, which was partially destroyed by fire some weeks ago. New offices have been built and the warehouse entirely remodeled. The company has occupied its renovated structure.

* * *

New applications for membership in the National Association of Waste Material Dealers, Inc., New York, include the Burlington Paper Stock Company, of Burlington, Vt.; the Independent Paper Stock Company, of St. Louis, Mo.; and the Indianapolis Paper Stock Company, of Columbus, Ohio.

* * *

Jesse H. Neal, formerly executive secretary of the American Paper and Pulp Association, has joined the organization of the Case-Shepperd-Mann Publishing Corporation, of New York, publishers of books on water works engineering, fire engineering, electricity on the farm, and municipal sanitation.

* * *

Scott Paper Company reports to the New York Stock Exchange for the six months ended June 30: Net profit after depreciation, taxes and other charges, $383,667, equal after preferred dividend requirements, to $1.82 a share on 168,792 common shares, compared with $431,127, or $2.07 a common share, in the corresponding period last year. Quarter ended June 30: Net profit after same deductions, $193,366, equal to 92 cents a common share, against $166,412, or 75 cents a share, in the second quarter of 1932.

* * *

The Wholesale Dealers in Paper Stock and Waste Materials Committee, a group of leading packers of waste paper and rags in the northeastern seaboard, embracing Massachusetts, Rhode Island, Connecticut and the metropolitan New York City area, who are working through P. M. Loddengaard, with headquarters at 120 Broadway, New York, has filed a code of fair competition in Washington. Along with the code was a lengthy survey, totaling about 40 pages, of conditions existing in the industry, which emphasized the necessity of the code under the National Industrial Recovery Act.

Awards for Government Paper

WASHINGTON, D. C., July 26, 1933.—The Whitaker Paper Company has been awarded the contract for furnishing the Government Printing Office with 2,000 sheets of 24 x 36 Quaker drab cloth lined paper at $147.90 per M sheets. The same firm will also furnish 704 sheets of 22 x 28 pink tough check board at $50.00 per M sheets. Bids for both of these items were received on June 21.

The Aetna Paper Company will furnish 9,900 pounds (75,000 sheets) of 26 x 34, No. 56, 50 per cent rag white natural tint paper at 11.84 cents per pound, and Barton, Duer & Koch Paper Company will furnish 3,000 sheets of 100 per cent rag light weight mounting board at $78.00 per M sheets and 2,000 sheets same at $146.00 per M. Bids for these items were received on June 19.

Freight Rate Hearing Postponed

Hearing dates on a petition of the Chicago and Northwestern and the Chicago, Milwaukee, St. Paul and Pacific railways to reduce freight rates on bituminous coal have been postponed by the Wisconsin Public Service Commission until July 25. The roads desire to reduce the rates from 85 cents to 6 cents a ton between Green Bay, Wis. docks and Appleton, and from 94 to 75 cents between Green Bay and Menasha and Neenah, Wis. This will permit them to meet barge competition.

W. H. Cloud Leaves Upson Co.

W. H. Cloud, superintendent of the paper mill division of the Upson Company, Lockport, N. Y., has resigned his position.

Mr. Cloud is undecided as to the future other than a month's rest at his home, 67 Elmwood avenue, Lockport.

PICTURE TAKEN AT FIRST ANNUAL OUTING OF WALKER GOULARD PLEHN CO.

PAPER TRADE JOURNAL
ESTABLISHED 1872

Published at 34 North Crystal Street, East Stroudsburg, Pa. Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

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Price, Per Copy, 10 Cents — United States, Per Annum, $4.00
Canada, including tax, $7.50; Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. XCVII New York, July 27, 1933 No. 4

This publication is now and always has been printed on paper made in the U. S. A.

URGES SUPPORT OF CODE

President Roosevelt, speaking Monday night over a nation-wide hookup on the radio, urging support of the voluntary code of shorter hours and increased wages, said the proposition is simply this:

"If all employers will act together to shorten hours and raise wages, we can put people back to work. No employer will suffer, because the relative level of competitive cost will advance by the same amount for all. But if any considerable group should lag or shirk, this great opportunity will pass us by and we will go into another desperate Winter. This must not happen."

TAPPI MANUAL OF STANDARDS

A book which has long been a need in the industry has now been made available to the members of the Technical Association of the Pulp and Paper Industry. This is the new TAPPI Standards, a loose leaf manual of tentative and official standard testing methods, specifications and recommended operating and engineering practices that have received recognition by the Technical Association.

The loose leaf form was adopted to provide for the addition and substitution of pages since the work of developing testing methods, specifications, and recommended practices will be continuous.

The divisions in the book correspond to the divisions of the Technical Association, namely management, engineering, raw materials, operating, converting and consuming, testing and research and development. The organization of TAPPI is such that the responsibility of keeping the manual up to date lies with the various committees.

It is the practice of the association to have all of its standards originate in committees. When a committee has given proper approval to a proposed standard it becomes a tentative standard of the association, in which status it remains for a period of at least one year. It may then be submitted to the association's active membership for vote, and if it is thereby properly approved it becomes an official standard of the association.

As might be expected, the contents of the testing division takes up the greater portion of the manual. In an egineering industry such as this it is of first importance to have ways and means of making measurements of pulp and paper properties and mill performance. There is still much work for the testing division to do and upon its results paper and raw materials specifications can be established and recommended operating practices defined.

The Industrial Recovery Act and the required codes being prepared under that act emphasizes the need that exists in the industry for technical facts. Under the administration of the act industry will need to have accurate knowledge of its costs and details of operation. The work done by the Technical Association now makes it relatively easy for the pulp and paper industry to state its case in clearly defined terms.

The association is also entitled to commendation for the appearance of the book itself. The highest grade of paper is used and the printing is excellent. The notebook cover is of heavy construction and will hold a block of paper about two inches thick. Heavy buff sheets separate the divisions and large printed tabs clearly indicate the divisions. The book, is in short, made for heavy use and will resist wear.

It has been a pleasure during the past few years to have frequent opportunities to commend the Technical Association on its excellent work. It is not strange that the association has continued to grow in numbers and in usefulness, when its aggressive policy of serving its members is considered. Any individual responsible for mill operation or engineering who is not a member of TAPPI is indeed losing a great deal.

FOREIGN PAPER TRADE

May exports of paper and paper products from the United States totaled $1,102,063, a slight increase over the April figure but a 22 per cent decrease when compared with the corresponding month last year according to the Paper Division of the Department of Commerce. Wall paper exports were more than triple those of last month and of those of a year ago. Bristol and bristor board and other paper board each scored an increase of 130 per cent over the preceding month, sheathing and building paper, 120 per cent; toilet paper, 80 per cent; news print, 38 per cent; cover paper, 35 per cent; overissue and old newspapers and filing folders, index cards and other office forms, each 20 per cent; other writing paper, 18 per cent; paper bags and boxes and cartons each 15 per cent; while slight increases are shown in book paper, not coated, fancy writing paper, envelopes and vulcanized fiber sheets, strips, rods and

tubes, and slight decreases in tissues and toilet paper and paper towels and napkins.

Heavy decreases compared with April figures are registered by wrapping paper, surface coated paper, fiber insulating board, wall-board of paper or pulp and blotting paper, and the following items show very substantial decreases when compared with the corresponding month last year: book paper, not coated, cash register and adding machine paper, news print, vulcanized fiber sheets, strips, rods and tubes, boxes and cartons, other writing paper, fancy writing paper, fiber insulating lath, other paper board, bristol and bristol board, paper towels and napkins, tissue and crepe paper, surface coated paper, wrapping paper, overissue and old newsapers, greaseproof and waterproof paper and cover paper, while a heavy increase is shown in exports of paper board and strawboard and slight increases in sheathing building paper, wallboard of paper or pulp and filing folders, index cards and other office forms.

May exports of paper base stocks were valued at $275,126, a 6 per cent increase over April but a 15 per cent decrease over May, 1932. Pulpwood exports were very low, amounting to only $1,737 against $10,737 in April and $19,220 a year ago. Exports of sulphite wood pulp show an increase of 10 per cent over the preceding month and a 10 per cent decrease over the corresponding month last year. Rags and other paper stock, with a valuation of $45,657, registered a slight increase over April.

Imports of paper and paper products in May amounted to $6,890,913 against $5,867,650 in April and $9,293,794 in May, 1932. News print imports amounted to $6,182,719 a decrease of $2,358,697 over those of the same month last year and a decrease of $798,003 over the preceding month. Imports of cigarette paper, books and covers were considerably heavier when compared with April but fell 10 per cent short of last year's record in May.

Paper base stock imports in May were valued at $3,133,752 against $2,411,558 in April and $3,137,868 in May, 1932. Pulpwood imports were high compared with April but low compared with the same month last year. Heavy increases over the preceding month are also shown in imports of ground wood pulp, both bleached and unbleached; sulphite wood pulp, both bleached and unbleached, unbleached sulphate and rags for paper stock, while the incoming shipments of soda pulp and bleached sulphate were considerably lighter. When placed beside the figures of a year ago huge increases are shown in unbleached ground wood pulp, unbleached and bleached sulphite pulp, bleached sulphate, and soda pulp.

Paper Div. Combined With Lumber

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 19, 1933.—Effective July 15 the Paper Division of the Department of Commerce was combined with the Lumber Division, now called the Lumber and Paper Division. L. H. Peebles is chief of the combined Division. Miss E. B. Frost is the only member of the old Paper Division retained in the new set up.

Paper Industry Cooperates

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 26, 1933.—W. W. Pickard, Deputy Administrator of the National Industrial Recovery Administration, who has direct charge of codes for the paper industry is much pleased with the cooperation and sincerity with which the paper trade is cooperating in the formulation of a code, he has stated to the correspondent of the PAPER TRADE JOURNAL.

Mr. Pickard has attended a number of meetings of various groups of the industry and has expressed his satisfaction in the way the industry is going ahead.

In the meantime, of course, President Roosevelt has called upon all the manufacturers of the country to sign an agreement with him to increase wages and shorten the hours of labor.

It is the hope of the Recovery Administration that this new blanket code will become effective as soon after August 1 as possible. It does, in fact, however, not become effective until the individual manufacturer has signed the agreement. The President has also set September 1 as the dead line when the codes of the various industries must be presented.

There seems to be some misundertanding regarding the blanket code. It is explained at the Recovery Administration that the blanket code is effective until the code of the industry to which the individual manufacturer belongs is accepted by the President and becomes operative. At that time, the industries own code is effective, and not the blanket code, regardless of the difference in these codes.

Child labor also is abolished after August 31st except in certain instances. Persons between 14 and 16 may be employed for three hours a day between the hours of 7 A.M. and 7 P.M. in such work as does not interfere with school hours but child labor is absolutely prohibited in manufacturing or mechanical industries.

President Roosevelt in presenting the blanket code or agreement to industry states that "this agreement is part of a nation wide plan to raise wages, create employment, and thus increase purchasing power and restore business. That plan depends wholly on united action by all employers. For this reason I ask you, as an employer, to do your part by signing.

"If it turns out that the general agreement bears unfair on any group of employers they can have that straightened out by presenting promptly their proposed code of fair competition."

Paper Mill Employment Rises

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 26, 1933.—June employment index number in the paper and pulp industry was 77.3 compared with 74.8 in May and 73.3 in June of last year taking 1926 at 100 according to the Bureau of Labor Statistics, Department of Labor. Payroll index for June in these same plants was 54.1 compared with 50.2 for May and 49.9 for June of last year.

In the paper box industry June index employment number was 73.6 compared with 69.1 for May and 69.1 for June of last year while payroll index for June was 61.4 compared with 55.8 for May and 57.8 for June of last year.

Bicking Mill No. 1 Resumes

The No. 1 mill of the S. Austin Bicking Manufacturing Company, Downingtown, Pa., which has been idle a long time, resumed operation a few days ago and will give employment to a number of men. The company has many orders on hand and both No. 1 and No. 2 mills will operate double turn.

INCREASINGLY POPULAR APPLICATIONS OF

ZINC SULPHIDE PIGMENTS

For the Paper Industry

ZINC SULPHIDE PIGMENTS

New Jersey Zinc Number 20

Number 19

• Number 13

The paper industry has taken advantage of the different amounts of ZINC SULPHIDE contained in the convenient range of the New Jersey Zinc Company's pigments to increase the opacity, color and brightness of a variety of papers to the desired degrees.

ZINC SULPHIDE PIGMENTS have been used in

Bonds
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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Report of the Committee on Permanence and Durability of Paper*

Your Committee on Permanence and Durability of Paper presents herewith its report—unanimously adopted—covering such facts as it has been able to gather together, relating to the permanence and durability of paper, deterioration of paper, its causes and remedy; and in addition presents its opinion in regard to the requirements for future experimental work.

This committee was authorized by the Executive Committee of the Technical Association of the Pulp and Paper Industry in May, 1929, and has for its purpose the following duties: To act as an advisory committee to the association in all matters relating to the subject of permanence and durability of papers, and the scope of this subject is to broadly cover all questions relating to the preservation of the written or printed record, as regards materials used, methods of manufacture into the final record, and methods of storage.

This committee was further instructed to criticize and act in an advisory capacity to the association in all permanence and durability investigations recorded in the literature on the subject, in order that it may present an authoritative viewpoint to the association, pointing out what had been accomplished to date and indicating what additional investigations were required.

It is the further object of this advisory committee to consider all the material presented on this subject, to review all data and conclusions presented, and from this information to present to the association only well established facts agreed to by all the committee members.

A previous report from this committee set forth two definitions as a basis for its work and these definitions are repeated as follows:

Permanence is the degree to which a paper resists chemical action which may result from impurities in the paper itself or agents from the surrounding air.

Durability is the degree to which a paper retains its original qualities under continual usage.

Much time during the past several years has been devoted by investigators both here and abroad to the study of causes affecting the permanence of paper, with conclusions attempting to point out remedial measures required by the paper manufacturer. Various experimenters have seriously disagreed with each other. Manufacturers of wood pulp papers and manufacturers of rag pulp papers have entered into controversies as to the permanence of their respective products. All of this has led to confusion, and a beclouding of the real issue, without benefit to the paper industry. Your committee deplores this condition and states without fear of contradiction that all branches of the paper industry will most assuredly benefit from a true knowledge and understanding of the subject.

Your committee includes in its report a review and criticism of some recent investigations which have appeared in the literature, chiefly during the past two years. No attempt has been made to furnish a complete bibliography on the subject of permanence and durability of paper. For a more complete list of the 1931 literature references the reader is referred to pages 33-34 of the Bibliography of Paper Making for 1931, published by this association. The references for 1932 are found also on pages 33-34 in the Bibliography for 1932, recently issued by the association.

Deterioration in a paper has been defined as the degree, or the amount of change it has undergone as compared to its original physical and chemical condition. The earliest recorded research concerning paper deterioration was conducted by the German Government about 1890 at Charlottenburg. Several years later, in 1898, the Royal Society of Arts in London presented an important report entitled, "The Deterioration of Paper." Both of these investigations presented similar findings, namely, that the most permanent type of paper should be made of cotton fibers. In 1904, the U. S. Department of Agriculture authorized a similar investigation and in 1911 a report was adopted which included a specification for a permanent printing paper. This specification is based not only on the fiber composition of paper but also on its other physical and chemical properties as well. since that date the U. S. Government has purchased all its paper under technical specifications covering both physical and chemical characteristics of each kind of paper.

It has been recognized for some time that the quality of paper alone is not the sole factor in determining its permanence. The conditions under which the paper is stored are of equal importance. Even the most carefully manufactured paper from the best of raw materials may deteriorate more rapidly under poor storage conditions than paper made even of mechanical wood pulp under very good storage conditions. The importance of adequate storage conditions for the preservation of the written or printed record can not be

* This report has been unanimously approved by the members of the TAPPI Permanency and Durability Committee consisting of F. C. Clark, chairman, Helen U. Kiely, John L. Parsons, E. O. Reed, Edwin Sutermeister, and B. L. Wehnshaff. It is published with the approval of the Executive Committee of the Technical Association of the Pulp and Paper Industry.

too strongly emphasized. A recent publication[1] of the U. S. Bureau of Standards should be in the hands of all those interested in the preservation of records and is recommended by the committee. Evidence is available that illumination, for instance, of the space for storage files should be by the use of incandescent electric light bulbs; gas jets and direct sunlight should be excluded. It has been further pointed out that the storage space should be well ventilated with clean, dust-free air, washed to remove traces of acid, at reasonably constant temperature and humidity. It is recognized today that even groundwood book papers carefully made, protected and stored under adequate conditions, may have their useful life appreciably lengthened beyond what it usually considered the life of such papers.

The comparative stability of fibrous materials and the question of paper permanence have also been the subjects of numerous recent investigations. The following articles, published during the past two years in this country, on the subject of permanence and durability are listed together with important deductions made and conclusions reached by the respective investigators. The committee has also included its comments as found necessary.

Durability of Purified Wood Fibers. G. A. Richter, Ind. Eng. Chem., 23, 371-370 (1931).

This article is based on the thesis that "The durability of paper is undoubtedly related to the purity of the fiber from which it has been fabricated and to the non-cellulosic materials that are added to impart desired characteristics" and that "the change in appearance of the fiber, as well as in physical and chemical characteristics, constitutes a measure of the stability of paper" when subjected to so-called accelerated aging tests. Both waterleaf and sized papers were used in the investigation. The committee is of the opinion that this article has presented no conclusive proof to show that artificially produced changes in the fiber characteristics of a paper precisely simulate natural aging conditions. Until this fact has become established no great reliance can be placed on accelerated aging tests as being a true measure of the permanence of paper. A study of the changes produced in paper by the application of heat may serve a very useful purpose, however, in understanding certain relationships among the various substances comprising a sheet of paper. For instance, the presence of acid residues is to cause hydrolysis of the cellulose and the effect of such substances can be intensified by heat treatment of the paper. In this article the statement is made that the deterioration of paper may be attributed mostly to oxidation and hydrolysis. Results of the investigation show that papers that are most resistant to oxidation and physical injury are consistently high in alpha cellulose content. The deleterious effect produced on papers exposed to sulphur dioxide gases was also observed.

Permanence Studies of Current Commercial Book Papers. John O. Burton. Bureau of Standards Journ. Research &, 429-439 (1931); Reprint Paper No. 349

This investigation is based on comparative experimental tests carried out on 28 commercial book papers. Although many of the conclusions are based on results from the use of a so-called accelerated aging test, the validity of which in the opinion of your committee has not been demonstrated, the importance of careful treatment during the manufacture of record papers is brought out. Fibers of a high quality may have their purity lowered as the result of improper processing, and fibers of much lower original purity may be purified by proper treatment. A system of classification is offered for book papers, based on the physical and chemical tests resulting from the examination of the 28 book papers. The papers are divided into four groups, the specifications for which include the determination of the following values: fiber composition, sizing materials, ash, basis weight, thickness, opacity, bursting strength, folding endurance, tearing strength, tensile strength, alpha cellulose, copper number, acidity and accelerated aging test. The last mentioned test (72 hours at 100 deg. C.) appears as a criterion only in one of the classes and, as mentioned above, the committee believes that owing to the fact that this test has not become established, any conclusions based on results from such an aging test with respect to the life expectancy of a paper are open to question as far as our present knowledge is concerned. The investigation demonstrates that the change in alpha cellulose content and in folding endurance, brought about by the accelerated aging test, is closely related to the acidity of the paper.

Accelerated Aging Test for Paper. R. H. Rasch. Bureau Standards Journ. Research 7, 465-475 (1931).

In the conclusion to this article which describes a 72 hour heat treatment at 100 deg. C. is found the following statement:

"Eventually it may be possible to build up evidence upon which a decision can be based as to whether the accelerated aging test described herein does or does not rate papers in accordance with their relative degree of permanence."

The committee is of the opinion that the preceding quotation expresses the present situation with respect to the accelerated aging test for paper as described in the above article.

Light Sensitivity. A. E. Kimberly and J. F. G. Hicks. Bureau Standards Journ. Research, 6, 819-827 (1931).

The following conclusion is drawn from a study of the effect of rosin and its impurities on paper in the presence of light:

". . . since rosin sized paper contains rosin, ferrous resinate, and rosin size contaminated with ferrous iron, and since these relationships have been shown to be sensitive to light, some relationship must exist between these facts and the discoloration ('yellowing') of papers upon exposure to light."

The Permanence of Paper. B. L. Wehmhoff. Paper Trade Journ., TAPPI Section, Pages 300-302 (June 9, 1932).

This article comprises an excellent review of the subject and is recommended by the committee to those interested in such a survey. In it, reference is made to the conclusions drawn by Dr Herzberg of the German Materialprüfungsamt in 1908 based on an examination of 435 samples of paper intended for permanent records and submitted by the University of Berlin. Dr. Herzberg concludes that fiber composition alone is not a sufficient specification and that the quality of the raw materials and their treatment in the process of manufacture are important and can only be insured by strength specifications. The statement is made that the League of Nations have considered the subject of paper permanence and its committee of experts has made the following statement with reference to the composition of permanent papers:

"A preference at the present state of the manufacturing process to be given to unbleached rag paper; it being un-

[1] A Survey of Storage Conditions in Libraries Relative to the Preservation of Records. By A. E. Kimberly and J. F. G. Hicks. Bureau of Standards Miscellaneous Publication No. 128.

derstood that new processes of treating cellulose may in the future provide paper of lasting quality."

According to the author there is no conclusive proof that the so-called accelerated aging test, comprising the heating of paper for 72 hours at 100 Deg. C. and making comparative physical and chemical tests before and after heating, determines the permanence of paper. This can be demonstrated only by giving the paper samples actual as well as accelerated aging tests. Several well known investigators are cited in support of this general statement.

The committee is in agreement with the statement made in the above review that at the present time the most permanent paper is made from all new white or unbleached rags carefully processed under controlled conditions to insure the desired quality and freedom from injurious chemicals, but that with our increasing knowledge of paper, its raw materials and processing, the future may provide a permanent paper made from other materials.

Estimating Stability of Paper by Heating. R. H. Rasch and G. O. Stone. Paper Trade Jo., TAPPI Section, pages 40-42 (July 28, 1932).

The heat treatment of paper in air for 72 hours at 100 Deg. C. is subjected to further study as a means for estimating the aging properties of paper.

"Very misleading results may be obtained unless sufficient care is exercised in the control of certain variables involved in the test . . . Suggestions are offered for minimizing errors resulting from these variables, and data are included to show the degree of reproducibility to be expected when adhering to these suggestions."

The Effect of Inorganic Acids on the Physical Properties of Waterleaf Rag Bond Paper. T. J. Jarrell, J. M. Hawkins and F. P. Veitch. Paper Trade J., TAPPI Section Pages 158-163 (Oct. 6, 1932).

"Acids and acid salts exert a slow deteriorating effect on paper, which may not be observable for many years.

"Although no relation has been established between the deterioration of paper under the experimental and actual conditions, it seems reasonable to assume that in general such a relation exists."

Deteriorative Effect of Sulphur Dioxide Upon Paper in an Atmosphere of Constant Humidity and Temperature. A. E. Kimberly. Bureau Standards Journ. Research, 8, 159-171 (1932).

Based on tests with 14 different commercial book and writing papers exposed to air conditions, a distinct embrittlement of the papers was noted and this was accompanied by variations in the chemical properties.

"The effects noted bore no constant relation to the initial quality of the papers; some of the lower grade papers, unsuitable in other respects for permanent records, showed the greatest resistance to the action of sulphur dioxide . . . the results obtained are considered quite convincing direct evidence of the desirability of preventing acid pollution of library air."

The Relative Stabilities of Rag and Purified Sulphite Pulps. H. F. Lewis. Paper Trade Journ. TAPPI Section Pages 239-262 (Nov. 24, 1932).

The investigation comprises a study of the chemical stability of three rag stocks and two purified sulphite pulps towards a variety of degradation agencies. These agencies included the use of heat under different conditions, alkaline solutions under varied conditions, acid solutions, and light from two sources; the carbon arc Madeometer and the Cooper-Hewitt quartz mercury lamp. The degradation was followed by the determination of such chemical constants as alpha cellulose, copper number, beta and gamma cellulose, pentosans, and cuprammonium viscosity. A summary of the data may be briefly made by stating that in the early stages of the degradation of cellulose by heat, certain forms of light, acids, and oxidizing agents, a micellar degradation occurs which is rapidly followed by chemical depolymerization. Alkaline solutions, on the other hand, modify the physical structure of the cellulose by swelling, without greatly altering the length and number of chains making up the micelle . . . In the main, the alkaline solutions attack the impurities of the cellulose much faster than they attack the cellulose fraction.

"The above generalizations hold either for rag pulps or for the highly purified sulphite pulps, the difference between the two being largely one of degree. This latter is due, in part to the particular polymerized non-anhydroglucose units present in the sulphite pulps, and in part, to a difference in the physical and chemical stability of the cellulose fraction."

Chemical stability is related, according to the author, to the alpha cellulose content of a pulp. High alpha cellulose content usually connotes a low copper number and such stocks are more resistant to the degrading action of the reagents investigated. The data are described as

"An indication of some of the tentative findings towards which we have been moving. Definite conclusions must inevitably wait upon the acquisition of further data and the development of still other techniques."

The committee believes that evidence is available to show that among the factors which are responsible for deterioration in paper are the following:

(1) Mechanical treatment, such as the flexing of the fibers, and a roughening of the paper surfaces. This may result in a reasonable decrease in its physical properties, but without any necessary change in its chemical properties.

(2) Chemical changes, resulting from light, either natural or artificial; impurities in the paper; substances in the air; and abnormal temperatures or humidities.

Changes in the physical and chemical properties of a paper can be determined by the use of accepted testing methods. Not all investigators agree, however, on the interpretation of the results with relation to permanence and durability. Some believe it to be of more value to determine the injurious substances present in paper while others emphasize the purity of its components. All permanent paper specifications indicate the maximum amount of rosin permitted. Recent researches have shown that light and impurities in the rosin may have a bearing on the deterioration of paper.

The committee is of the opinion that future studies should deal with the different variables involved in the conversion of fibrous cellulosic material to paper; that a knowledge of these factors, such as beating, sizing, drying and finishing as well as the purity of the components of paper, and their relations, would place the industry on a much more scientific basis. In any single investigation, however, the committee suggests that the factors involved be limited to a relatively few in order that the results may be more readily understandable and applicable.

A study involving the storing of a variety of papers of known history under various known conditions for different lengths of time is recommended. At intervals of three to five years samples could be collected and tested independently by several paper technologists to be selected perhaps by the association.

As already stated the committee believes that the various accelerated aging tests, employed for determining the probable life of a paper, at the present time have not been confirmed by natural aging tests. The use of accelerated aging tests in specifications for paper, is of questionable value,

therefore, at the present time. Time has proven that permanence is insured by the use of new white or unbleached cotton, flax or hemp fibers, carefully processed, in the manufacture of a paper which is stored under average conditions. This is due to the fact that the introduction of other cellulosic material, such as wood fibers, is rather recent. A well made modern chemical wood pulp paper will probably have a longer life than a similar paper made forty years ago, although the precise life of a sheet is unknown. The statement has been made that the life of a paper depends essentially on two factors: The quality of the paper and its storage conditions. The committee believes there is general agreement on the latter, but concerning the former considerable controversy exists as to just what quality is desired for permanence owing chiefly to our lack of knowledge of the subject.

Increasing attention is being paid to specifications for paper and the committee recommends that as far as possible only standard TAPPI testing methods should be employed for such specifications.

Although it is not within the scope of this committee report to make detailed recommendations dealing with future researches concerning the permanence and durability of paper or to cover all the finds on the subject, the committee does believe that the offering of certain suggestions as to future work and the presentation of what we consider to be established facts on the subject will be helpful to the industry.

Acid from Air Deteriorates Books

The National Bureau of Standards has found that the paper of books stored in city libraries is in a much poorer state of preservation than the paper of identical volumes which have been kept in country or suburban institutions. Analyses of the fiber of the paper of city books indicates that their cellulosic components have been adversely affected, resulting in embrittlement and discoloration of the paper. This greater deterioration of city books is largely ascribed to the presence in the air in urban libraries of small amounts of sulphur dioxide, an acid-forming gas resulting from the combustion of fuel and from certain industrial processes. Laboratory work previously reported showed that concentrations of 2 to 9 parts sulphur dioxide per 1,000,000 parts of air caused a marked deterioration of paper in 240 hours. This deterioration in the laboratory was accompanied by an abnormally high acidity which was also found in the paper of books stored in cities. Since all libraries cannot be located in rural or suburban districts, the Bureau has suggested that polluted air be given an alkaline washing to remove the acid fumes before the air is admitted to libraries. A complete report of this investigation is contained in the Bureau Miscellaneous Publication No. 140, which can be obtained from the Superintendent of Documents, Washington, D. C. for five cents (cash).

Delphos Paper Mill Reopens

[FROM OUR REGULAR CORRESPONDENT]

FORT WAYNE, Ind., July 24, 1933.—Seventy men have gone to work at the plant of the Hinde & Dauch paper company at Delphos, Ohio, near here. The plant had been closed several months. The company will manufacture chip board for about 30 days and then make strawboard. The city council at Delphos has agreed to apply for a United States reconstruction loan to improve a waste way from the plant to eliminate objectional refuse. The company will pay off the loan at a given rate per ton of paper manufactured.

Conditioning Lithographic Papers

The Bureau of Standards in its study of causes of misregister of successive color prints in the offset lithographic process has demonstrated that changes in the dimensions of the printing papers caused by variations in moisture content is one prolific source of trouble. It further found that in conditioning the papers under fixed humidity and temperature conditions so as to secure a uniform moisture content, the final moisture content was dependent to some extent on whether the initial moisture content was greater or less than when the moisture was in equilibrium with the controlled atmospheric conditions. The voidance of large initial variations from the standard condition was therefore recommended. Further study has just been completed to find if small differences such as might unavoidably occur in commercial operations are important.

The reactions of representative lithographic papers to changes in relative humidity were studied using the following humidities 50, 40, 48, 40, 45, 40, 42½, 40, 37, 40, 35 and 40 per cent in the order given. The change in moisture content was practically proportional to the magnitude of the humidity change in each case and the hysteresis effects, that is, influence of direction of approach to a given humidity, were extremely small, the maximum hysteresis effect in this series being slightly less than .1 per cent. From these results it appears that the magnitude of the hysteresis effect with a relative humidity change is dependent on the extent of the humidity change. Hence in conditioning papers for printing, the hysteresis effects will not be important if the initial moisture content of the paper is not too greatly out of equilibrium at the start.

Pennsylvania Salt Manufacturing Co. Joins TAPPI

The first chlorine company to become a member of the Technical Association of the Pulp and Paper Industry is the Pennsylvania Salt Manufacturing Company, whose headquarters are in the Widener Building in Philadelphia.

The Pennsylvania Salt Manufacturing Company were pioneers in the manufacture of paper makers alum, having begun the manufacture of this product in 1870. The company was incorporated in 1850 and has been serving the paper industry for more than a half century.

The company is also one of the pioneers in the manufacture of liquid chlorine and was the first to ship this chemical in tank cars on the American continent. The first shipment was in November 1909.

Kryolith has been imported from Greenland since 1865 and bauxite is being imported for the manufacture of alum.

Plants are located at Natrona, Pa.; Philadelphia, Wyandote, Michigan; Menominee, Mich.; Tacoma, Wash., and Madison, Wis.

The officers of the Pennsylvania Salt Manufacturing Company are: Leonard T. Beale, president; N. E. Bartlett, Jr., vice-president; Y. F. Hardcastle, vice-president; and L. A. Smith, secretary-treasurer.

Latex Industries Add Beater

[FROM OUR REGULAR CORRESPONDENT]

BEAVER FALLS, N. Y., July 24, 1933.—Another beater is being installed at the plant of the Latex Fiber Industries which will allow an increase in production. The plant has been running near capacity for some time and the decision to enlarge manufacturing facilities came about through the booking of increased business. It is understood that the working force will also be enlarged.

A Comparison Between Flint Pebbles and Porcelain Balls As A Means of Hydrating In The Pebble Mill Test- II*

F. C. Peterson[1] and D. C. Beyer[2]

Abstract

Porcelain balls have indicated their superiority over flint pebbles in producing a treated pulp, the test results of which are both uniform and reproducible.

The use of porcelain balls is decidedly advantageous where for the purpose of accuracy of pulp containing a low ash content is desired. A similar effect was noted when small flint pebbles were used.

Twenty minutes additional milling are required to produce a peak in the Mullen curve when porcelain balls are substituted for flint pebbles.

Since porcelain balls of similar physical characteristics may be produced in quantity, thus differing from flint pebbles, their use as a milling agent is recommended in the strength testing of wood pulp.

In an earlier publication, Peterson, Jeffrey and Maughan[3] have indicated the feasibility of using round porcelain balls as a means of promoting hydration in the pebble mill test. The accuracy of the method was improved by such a substitution as viewed from the standpoint of reproducibility of test results which was due apparently to the greater uniformity in size and shape of the balls as compared to flint pebbles.

The experimental work reported herewith represents a more comprehensive study of porcelain balls and flint pebbles of various sizes compared on a volume as well as a weight basis throughout the entire range of the strength curve. The ash content of the treated pulps is likewise included since there appears to be a distinct relationship between this value and the wearing qualities of the hydrating agent.

In our earlier investigations[3] difficulty was experienced in obtaining a satisfactory ball which was of uniform hardness throughout and which did not contain a soft interior core covered with the harder porcelain glaze. The existence of such conditions was indicated by the volume and weight changes recorded after milling for 100 hours. The balls used in present investigation were of solid porcelain throughout and were furnished through the courtesy of the Coors Porcelain Company. Although hand made they were of uniform contour and measured 1.25 (±.05) inches in diameter. The density of such balls was found to be 2.315 as compared to 2.54, 250 and 2.57 for large, standard and small flint pebbles respectively.

Procedure

Prior to its introduction into the ball mill the pulp sample of known moisture content was broken up by means of a disintegrator similar to that described by Moore and Willets.[4]

The pebble mill used was furnished by the Abbe Engineering Company of New York and listed as size C.

CHARGING THE MILL.—The charge for one run consisted of the equivalent of 90 grams of oven-dry pulp, following which was added sufficient water at 20 deg. C. to bring the total liquid volume up to 2000 cc.

The volume, weight and number of porcelain balls and flint pebbles used in the various runs are recorded under experimental data.

ROTATION OF THE MILL—The mill revolved at 60 r.p.m. as shown by a revolution counter. At the end of each 1200 revs. (20 minutes), the mill was stopped and the entire charge dumped, after which the pebbles were separated from the pulp. Four separate portions of pulp were beaten for each test for 1200, 2400, 3600 and 4800 r.p.m. respectively.

PREPARATION OF SHEETS—The pulp charge, after separation from the pebbles was diluted to 20 liters with water at 20 deg. C. Sufficient pulp to give a sheet of approximately 65 pounds (25 x 40-500) basis weight was then dipped from the diluted stock. Five sheets were then prepared using a sheet machine of the type described by Shaw, Bicking, and Snyder.[5] Agitation of the stock prior to dipping was accomplished without mechanical aid. No vacuum was applied to the machine during the drainage period.

The sheets were removed from the machine by couching upon a moist felt which prior to use was pressed by hydraulic means for 30 seconds at a pressure of 30 pounds per square inch.

PRESSING.—All pressing was accomplished through the use of hydraulic pressure. After removal from the sheet machine, the felt with its adhering sheet was covered with another moist felt and pressed for 30 seconds at a pressure of 30 pounds per square inch. The sheet was then removed, placed between eight dry, clean blotters previously seasoned at 65 deg. r.h. at 70 deg. F. and again pressed for 5 minutes at a pressure of 200 pounds per square inch. The final pressing was carried out by placing the sheet between four dry blotters following which it was subjected to a pressure of 200 pounds per square inch for 2 minutes. The sheets for a particular time interval of beating in "book" form, were all pressed at the same time.

DRYING AND WEIGHING.—The sheets were air-dried over-night, without tension, at 65 deg. r.h. at 70 deg. F. After drying they were trimmed to a standard size (8½ x 10½ inches) and weighed to the nearest .01 of a gram.

TESTING.—All testing was carried out at 65 deg. r.h. at 70 deg. F. Four test sheets, previously cut diagnonally in half, were used for the Mullen test. Four pops were made along the diagonal of each half sheet thus giving a total 32 pops for the bursting strength test. The burst-

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* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.

[1] Member TAPPI, professor New York State College of Forestry, Syracuse, N. Y.

[2] Student, New York State College of Forestry.

[3] Peterson, Jeffrey and Maughan, Paper Trade J. *93*, No. 16:36 (1931).

[4] Moore and Willetts, Paper Trade J. *92*, No. 18: 45 (1931).

[5] Shaw, Bicking and Snyder, Paper Trade J., *90*, No. 8:264 (1930).

ing strength was calculated according to the following formula:

$$\text{Bursting Strength} = \frac{\text{Average 32 pops} \times 100}{\text{Average ream weight of sheets}} = \text{Points per 100 pound ream}$$

The remaining sheet was used for the Elmendorf tear test. Four strips of standard size were cut from this sheet. A total of ten tear tests were taken for the Elmendorf value. Two strips were torn simultaneously in the tester. The tearing strength was calculated as follows:

$$\text{Tearing Strength} = \frac{\text{Average 10 tears} \times 100}{\text{Ream weight of sheets}} = \text{Points per 100 pound ream}$$

Strips of standard size were cut from the popped sheets for the tensile strength test. Ten such tests were made at each interval. The tensile strength was found in terms of breaking length as follows:

$$\text{Breaking Length} = \frac{\text{Length of strip in meters} \times \text{average kilogram force}}{\text{Average gram weight of strip}}$$

L = .180 meters.

Experimental Data

Part A

Volume Comparison of Porcelain Balls and Flint Pebbles—Bleached Sulphite Pulp.

TABLE I
BURSTING STRENGTH VALUES
Porcelain Balls—Volume 1780 cc.—Weight 4110 grams—90 Balls
Mullen (Points per 100 pound Ream)

Time (min.)	1st (run)	2nd (run)	3rd (run)	Average
0	35	38	36	36
20	88	88	88	88
40	100	105	101	102
60	116	120	112	116
80	126	124	127	126
100	110	122	115	116
Standard Flint Pebbles—Volume 1780 cc.—Weight 4455 Grams—76 Pebbles				
0	35	38	36	36
20	93	89	94	92
40	107	107	108	107
60	127	125	120	124
80	119	117	116	117

TABLE II
TEARING TEST VALUES

Porcelain Balls—Volume 1780 cc.—Weight 4110 Grams—90 Balls				
0	239	230	222	230
20	188	190	192	190
40	162	163	166	164
60	141	139	148	143
80	153	151	159	154
100	158	147	160	155
Standard Flint Pebbles—Volume 1780 cc.—Weight 4455 Grams—76 Pebbles.				
0	239	230	222	230
20	152	155	153	153
40	125	129	134	129
60	160	167	157	161
80	148	146	141	145

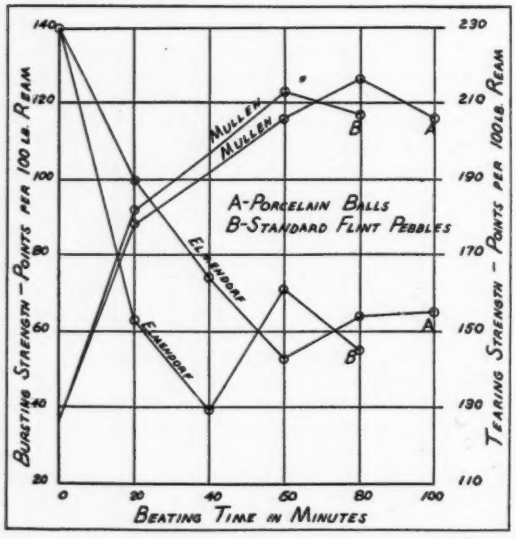

FIG. 1.
Comparison of Bursting Strength and Tearing Strength Values for 1780 c.c. of Porcelain Balls and Standard Flint Pebbles. (See Part A—Tables I and II.)

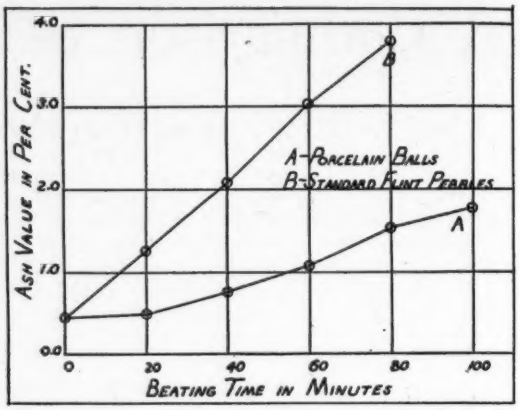

FIG. 2.
Comparison of Ash Values of 1780 c.c. of Porcelain Balls and Standard Flint Pebbles. (See Part A—Table III.)

TABLE III
ASH VALUES
Porcelain Balls—Volume 1780 cc.—Weight 4110 Grams—90 Balls.

Time (min.)	Ash (Per cent)		
0	.44	.46	.45
20	.49	.51	.50
40	.75	.79	.77
60	1.06	1.11	1.09
80	1.57	1.49	1.53
100	1.76	1.78	1.77
Standard Flint Pebbles—Volume 1780 cc.—Weight 4455 Grams—76 Pebbles.			
0	.44	.46	.45
20	1.21	1.30	1.26
40	2.06	2.06	2.06
60	2.95	3.08	3.02
80	3.77	3.83	3.80

Part B

Weight Comparison of Porcelain Balls and Flint Pebbles—Bleached Sulphite Pulp

TABLE I
BURSTING STRENGTH VALUES
Porcelain Balls—Weight 4570 Grams, Volume 1970 cc.—100 Balls

Time (min.)	1st (run)	2nd (run)	3rd (run)	Average
0	35	38	36	36
20	91	89	...	90
40	103	106	...	105
60	123	121	...	122
70	124	120	123	122
80	122	120	...	121
100	109	107	...	108
Small Flint Pebbles—Weight 4570 Grams—Volume 1780 cc.—295 Pebbles				
Mullen (Points per 100 lb. ream)				
0	35	38	36	36
20	88	90	..	89
40	106	104	..	105
60	119	113	..	116
80	107	111	..	109
Large Flint Pebbles—Weight 4570 Grams—Volume 1800 cc.—56 Pebbles.				
0	35	38	36	36
20	89	85	..	87
40	104	107	..	106
60	112	113	..	113
80	105	109	..	107
Standard Flint Pebbles—Weight 4570 (4455) Grams.—Volume 1780 cc.—76 Pebbles				

Values obtained in Part A, Table I, used due to proximity of Pebble Weights of the two tests.

TABLE II
TEARING TEST VALUES
Porcelain Balls—Weight 4570 Grams.—Volume 1970 cc.—100 Balls
Tear (Points per 100 pound ream)

Time (min.)	1st (run)	2nd (run)	3rd (run)	Average
0	239	222	230	230
20	162	157	...	160
40	142	135	150	142
60	129	147	...	138
80	118	122	...	120
100	150	141	...	146
Small Flint Pebbles—Weight 4570 Grams—Volume 1780 cc.—295 Pebbles				
0	239	222	230	230
20	142	138	...	140
40	136	150	...	143
60	153	138	...	146
80	149	148	...	149
Large Flint Pebbles—Weight 4570 Grams.—Volume 1800—56 Pebbles.				
0	222	239	...	230
20	180	194	...	187
40	165	160	...	163
60	138	139	...	139
80	133	135	...	134
Standard Flint Pebbles—Weight 4570 (4455) Grams—Volume 1780 cc.—76 Pebbles. (See Part A, Table II)				

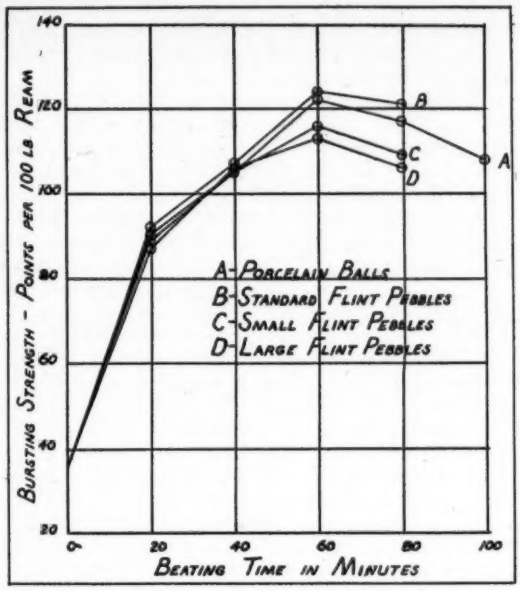

FIG. 3
Comparison of Bursting Strength Values of 4570 grams of Porcelain Balls and Standard, Large and Small Flint Pebbles. (See Part B—Table I).

TABLE III
ASH VALUES

Porcelain Balls—Weight 4570 grams—Volume 1970 cc.—100 Balls

Time (min.)	Ash (Per cent)			
0	.44	.46	...	.45
20	.60	.63	...	.62
40	.93	.95	...	.94
60	1.10	1.20	...	1.15
80	1.60	1.65	...	1.63
100	1.86	1.80	...	1.83
Small Flint Pebbles—Weight 4570 Grams—Volume 1780 cc.—295 Pebbles.				
0	.44	.46	...	.45
20	.77	.85	...	.81
40	.83	.88	...	.86
60	1.05	1.02	...	1.04
80	1.20	1.22	...	1.21
Large Flint Pebbles—Weight 4570 Grams—Volume 1800 cc.—56 Pebbles				
0	.44	.46	...	.45
20	1.40	1.43	...	1.37
40	2.38	2.41	...	2.40
60	3.20	3.27	...	3.24
80	4.37	4.42	...	4.39
Standard Flint Pebbles—Weight 4570 (4455) Grams—Volume 1780 cc.—76 Pebbles. (See Part A—Table III)				

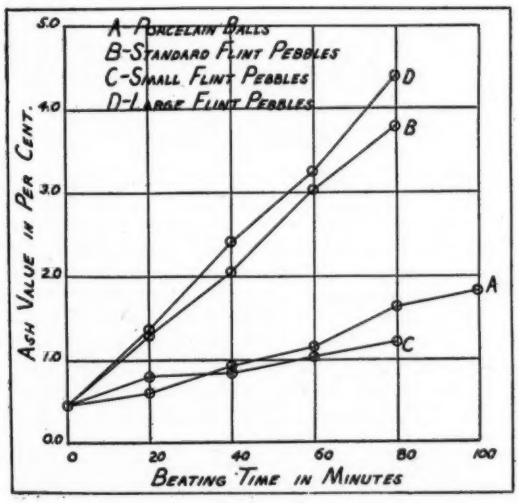

FIG. 5
Comparison of Ash Values of 4570 Grams of Porcelain Balls and Standard, Large and Small Flint Pebbles. (See Part B—Table III).

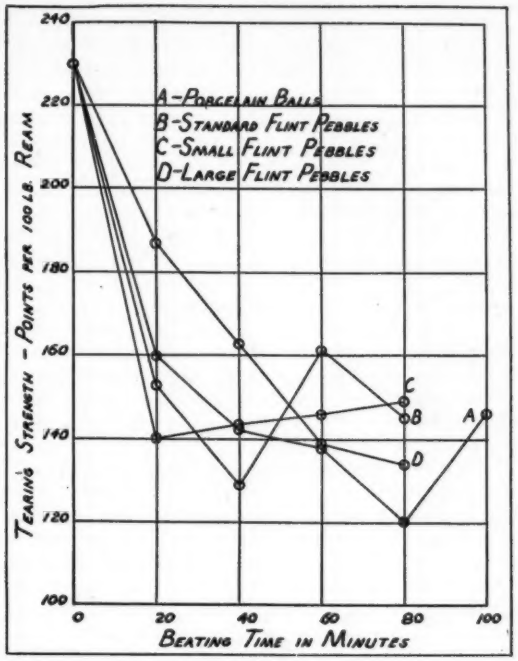

FIG. 4
Comparison of Tearing Strength Values of 4570 Grams of Porcelain Balls and Standard, Large and Small Flint Pebbles. (See Part B—Table II).

TABLE IV
TENSILE STRENGTH VALUES

Time (min.)	Breaking Length (in Meters) Porcelain Balls—Weight 4570 grams Average	Small Pebbles—Weight 4570 grams Average
20	3.4	4.9
40	4.7	4.7
60	5.3	5.1
80	5.6	4.9
100	4.2	..
	Large Pebbles—Weight 4570 grams	Standard Pebbles—Weight 4570 (4455) grams
20	3.2	3.1
40	4.0	3.9
60	4.5	3.7
80	4.6	3.7

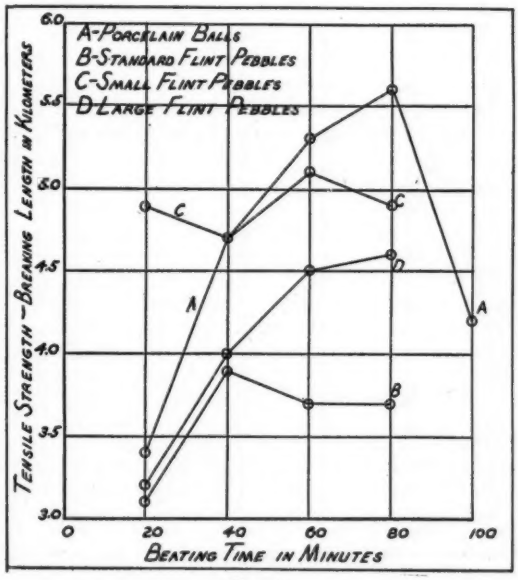

FIG. 6
Comparison of Tensile Strengths of 4570 Grams of Porcelain Balls and Standard, Large and Small Pebbles. (See Part B—Table IV).

Summary and Discussion

(1) It requires longer treatment in the ball mill to produce the maximum Mullen value of the strength curve with porcelain balls as compared to the various sizes of flint pebbles. Experiments indicate that porcelain balls produce such a break in the beating curve with an additional twenty minutes of milling over that required for pebbles, regardless of whether this comparison is made on a weight or volume basis.

More recent studies by Peterson and Kolesinskas[6] indicate that a peak in the Mullen strength curve may be attained with 60 minutes of beating if the number of porcelain balls are increased to a total of 110 or more.

(2) In general, porcelain balls give higher bursting and tear values at the peak of the strength curve than do flint pebbles. If the tearing test is taken in part as an index of fiber length, we may attribute the higher test values produced by the porcelain balls to be the result of reduced cutting action on their part.

(3) The results indicate a greater degree of uniformity in the individual Mullen and Elmendorf values when porcelain balls are used as compared to flint pebbles. The tear values show irregularities characteristic of the test and hence are probably subject to slight correction. The uniform size and shape of the porcelain balls is undoubtedly responsible for a more constant action in the mill which would tend to give more uniform curves.

(4) The tensile strength comparison of equal weights of porcelain balls and flint pebbles failed to show any significant results. A marked variation in bursting length was noted only in the case of porcelain balls.

(5) In general, pulp beaten with porcelain balls has a decidedly lower ash content throughout the entire beating cycle than that treated by means of flint pebbles. An exception is noted, however, in the case of small flint pebbles in which instance a lower retention of ash obtains at the peak of the Mullen curve.

A further inspection and comparison of the test data for the various milling agents reveals several additional and interesting facts. When compared on a volume basis, the ash content of the beaten pulp at the maximum Mullen value is found to be 1.53 and 3.02 per cent respectively for porcelain balls and standard flint pebbles which when expressed on a percentage basis indicates that flint pebbles are responsible for a 97.3 per cent increase in the ash content of the pulp over that produced by beating with porcelain balls. A similar comparison based on equal weights of porcelain balls, small and large flint pebbles indicates an ash content at the Mullen peak of 1.15, 1.04 and 3.24 per cent respectively. The use of the large sized pebble results in an increase of 181.7 per cent in the ash content of the beaten pulp over that obtained when milling is accomplished with porcelain balls, whereas under similar conditions a decrease of 9.5 per cent in ash is to be noted when small flint pebbles are selected to produce hydration. The ash comparison of equal weights of porcelain balls and standard flint pebbles is shown to be 1.15 and 3.02 per cent respectively at the maximum Mullen, the latter value having been obtained from Part A, Table III since for all intents and purposes the weight of standard flint pebbles required for the volume comparisons in Part A may be considered as identical with that selected as a basis of study in Part B (differing only by 125 grams). In this instance it is to be noted again that flint pebbles are responsible for a higher percentage of ash in the beaten pulp than that exhibited in the case of porcelain balls, the amount retained by the former being 162.6 per cent greater than in the latter case.

[6] Unpublished data of Peterson and Kolesinskas.

Proposed Methods for the Dirt Count of Pulp and Paper*

By F. A. Simmonds[1], P. S. Billington[2] and P. K. Baird[3]

Abstract

A review of several methods for determining the dirt content of pulp and paper which are in current use in mill laboratories has been made. Composite methods were then arranged which embodied the most desirable parts of the several methods.

The need for a standardized procedure for the quantitative determination of the dirt content of pulp and paper is indicated by the number of different methods now in use in pulp and paper mills. The term "dirt" as used includes all extraneous particles such as specks, shives and threads. Since practically nothing has been published on the subject, descriptions of some of the methods now in use were obtained through correspondence with various mills. This article presents two methods that embody the most desirable parts of the several methods studied. The two methods are proposed by the Forest Products Laboratory as tentative standards.

A general opinion was found to exist that for pulps the dirt content should be based on a unit weight of pulp whereas for paper it should be based on a unit area of surface. In this study it was thought desirable to limit the size of the extraneous particles as a further refinement of the procedure.

Experimental Procedure

An apparatus, which is described in another section of this article, was developed and used in the experimental part of the work.

The materials used consisted of test sheets made from several commercial and laboratory pulps and samples of commercial writing and mimeograph papers. Pulp sheets were trimmed to 5 by 7 inches, after which they were inspected in the apparatus and the dirt particles measured and counted. All particles except threads were considered as circular bodies, the longest dimension being taken as the diameter. The total length of the threads was measured.

The best procedure for observing and evaluating the dirt particles was evolved through experimentation and is described in the outline of the methods given later in this report. The data compiled in this connection are shown in Tables I and II.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.
[1] Member TAPPI, asst. chemist, Forest Products Laboratory, Madison, Wis.
[2] Assoc. member TAPPI, junior chemist, Forest Products Laboratory.
[3] Member TAPPI, senior chemist, Forest Products Laboratory.

TABLE I
SIZE DISTRIBUTION OF DIRT PARTICLES IN TEST SHEETS OF SEVERAL PULP SPECIMENS

Pulp		Sheets per specimen	Average basis weight of specimen (pounds)	Number of particles[1] per specimen: Specks: Less than 0.16 mm.	Specks: 0.16 to 0.32 mm.	Specks: 0.32 to 0.48 mm.	Specks: 0.48 to 0.64 mm.	Specks: Larger than 0.64 mm.	Shives, all sizes
Bleached sulphite	No. 1	4	84.35	2	1	0	0	2	..
	No. 2	4	54.42	3	4	0	0	1	..
Bleached sulphate		4	52.72	0	0	0	0	0	..
Bleached soda		4	45.24	25	11	3	0	0	..
Unbleached sulphite	No. 1	3	61.91	10	8	2	0	0	..
	No. 2	3	39.12	8	5	0	0	2	..
	No. 3	4	45.92	14	30	11	8	4	..
Unbleached sulphate	No. 1	2	59.86	4	3	1	0	0	..
	No. 2	4	48.64	1	2	2	0	1	..
						[2]	[2]	[2]	
Groundwood: Commercial	No. 1	4	45.58	33	22		1		..
	No. 2	2	56.90	9	21		17		23
Forest Products Lab. Grinder run	No. 77e	2	56.20	41	35		30		22
	No. 78	2	52.40	33	32		16		8
	No. 79	2	50.60	22	14		16		21
	No. 80	2	52.00	40	39		25		31
	No. 81	2	50.00	26	16		11		44
	No. 82	2	50.60	28	31		17		29
	No. 83	2	42.40	28	5		11		13
Total of all samples		..	....	327	279		181		191

[1] No threads appeared in these materials. [2] Greater than 32 mm.

TABLE II
SIZE DISTRIBUTION OF DIRT PARTICLES IN THE PAPER SPECIMENS

Specimen Number	Particles (no shives present): Specks: 0.16 mm. or less Number	Specks: 0.16 to 0.48 mm. Number	Specks: Greater than 0.48 mm. Number	Threads Total length Mm.
1	7	4	0	4.1
2	8	3	0	..
3	3	1	0	..
4	4	3	0	1.6
5	1	1	0	..
Totals	23	12	0	5.7

DETERMINATION OF THE DIRT COUNT OF PULP (F. P. L. METHOD NO. 102)

I. Apparatus

1. An 8 by 10-inch ground-glass plate mounted on an asbestos-lined illuminating box fitted with frosted electric light bulbs is to be used as an illuminating unit. The glass plate shall be ruled off into one-inch squares, and mentally numbered from 1 to 80 inclusive beginning in the upper left-hand corner and proceeding from left to right as illustrated in Fig. 1.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

FIG. 1
Method of numbering of the squares on illuminating glass.

2. A wide-field microscope tube fitted with an eyepiece-micrometer, and a suitable holder, capable of a magnification of 10 diameters is used for measuring the particles.

II. Specimen

The specimen shall consist of four, 5 by 7-inch pulp test sheets of 45 to 55 pounds weight calculated on a ream size of 24 x 36 — 500 (basis weight).

III. Method

Place a test sheet on the illuminated ground-glass in the upper left-hand corner. Count and measure all particles observed in areas corresponding to squares 1, 16, 24, 32, and 46 of the ground-glass. In measuring the particles consider the longest dimension as a diameter, and classify them according to the following groupings:

1. Specks: (a) small—Number between 0.5 mm. and 0.15 mm.
   (b) large—Number larger than 0.5 mm.
2. Shives: (a) small—Number between 1 mm. and 0.15 mm.
   (b) large—Number larger than 1 mm.
3. Threads: (a) small—Number between 2 mm. and 0.2 mm.
   (b) large—Number larger than 2 mm.

Repeat the above procedure for the three remaining sheets of the specimen.

Finally, determine the total weight of the specimen.

IV. Report

The dirt content of pulp shall be reported as the number of extraneous particles per pound (Multiply by 2.204 for conversion to metric units), both as a total and classified according to the class groups. The equation to be used for this calculation is:

$$D = 7 \frac{n}{W}$$

where D = the dirt content per pound of pulp.
n = the number of particles.
W = the total weight in pounds of the specimen.

The following tabulation form is suggested:

DIRT COUNT PER POUND OF PULP

Specks: Small	Specks: Large	Shives: Small	Shives: Large	Threads: Small	Threads: Large
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....

DETERMINATION OF THE DIRT COUNT OF PAPERS (F. P. L. METHOD NO. 99)

I. Apparatus

1. An 8 by 10-inch ground-glass plate mounted on an asbestos-lined illuminating box fitted with frosted electric light bulbs is to be used as an illuminating unit. The glass plate shall be ruled off into one-inch squares and mentally numbered from 1 to 80 inclusive beginning in the upper left-hand corner and proceeding from left to right as illustrated in Fig. 1.

2. A wide-field microscope tube fitted with an eyepiece micrometer, and a suitable holder capable of magnification of 10 diameters is to be used for measuring and counting the particles.

II. Specimen

The specimen shall consist of one or more 8 by 10-inch sheets of the sample selected.

III. Method

Place the specimen on the ground-glass and with the illumination coming from below, outline the areas corresponding to square 1, 6, 25, 29, 44, 52, 56, and 80. The specimen shall then be illuminated from above and all extraneous particles visible with the unaided eye shall be circumscribed with a penciled line, after which by means of illumination from below the sizes of the encircled particles shall be determined with the aid of the microscope. In measuring the particles consider the longest dimension as a diameter, and classify them according to the following groupings:

1. Specks: (a) small—Number between 0.5 mm. and 0.15 mm. (b) large—Number larger than 0.5 mm.
2. Shives: (a) small—Number between 1 mm. and 0.15 mm. (b) large—Number larger than 1 mm.
3. Threads: (a) small—Number between 2 mm. and 0.2 mm. (b) large—Number larger than 2 mm.

The specimen shall then be turned over and so placed that square 1 on the side first examined shall be superimposed on square 71 of the ground glass. Outline the areas corresponding to squares 2, 14, 18, 40, 41, 47, 63, and 79 of the ground-glass and repeat the procedure given above for observing, classifying, measuring, and counting the particles.

IV. Report

The dirt content of a paper shall be reported as the number of extraneous particles per square foot (Multiply by 10.764 for conversion to metric units), of surface classified according to the specified class- and size-groups. The equation to be used for these calculations when the specimen consists of one sheet is:

$$D = 9n$$

where D = the dirt count per square foot.
n = the number of particles in a size group.

The following tabulation form is suggested:

DIRT COUNT PER SQUARE FOOT OF PAPER

Specks		Shives		Threads	
Small	Large	Small	Large	Small	Large
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....

Patents Developments in 1932*

By C. W. Rivise[1]

During February and March of 1932, hearings were held by the Patents Committee of the House of Representatives to ascertain what changes are necessary in our patent laws. As a result of the hearings, a number of bills were introduced into Congress. The following is a list of the bills now pending in Congress and includes those proposed as a result of the hearings:—

H.R. 8984, a bill authorizing the licensing of patents owned by the Government of the United States to private individuals.

H.R. 10,157, a bill authorizing the Commissioner of Patents to close up applications which have been pending more than three years.

H.R. 10,741, a bill to provide an increased permanent force in the classification division of the United States Patent Office in order to bring and keep up-to-date the classification system for prior issued patents. The enactment of this bill will undoubtedly result in a more thorough and expeditious examination of patent applications and decrease the number of invalid patents. The bill carries an increase of $125,000 in appropriations and its passage is therefore doubtful.

H.R. 10,924, a bill making it a valid defense in a suit on a reissued patent that the defendant had begun the alleged infringing acts in good faith before the issuance of the reissued patent. This defense would not, however, be available to the defendant as to any claims which were included in both the original and reissued patents.

H.R. 11,010, a bill providing that an invalid claim shall not invalidate the entire patent and that an invalid claim may be eliminated by means of a disclaimer.

H.R. 11,016, a bill providing that the term of a patent shall terminate at a date not more than twenty years from the date of filing of the earliest application disclosing the invention, and not more than seventeen years from its date of issuance. Under stated circumstances, not more than two years may be added to the life of a patent before its issuance in order to bring its effective life up to seventeen years.

H.R. 11,017, a bill providing that a patent application need be signed at only one place, instead of in three places as at present.

H.R. 11,018, a bill empowering the assignee of an invention to file divisional, continuing, renewal and reissue applications covering the same invention.

H.R. 11,019, a bill to limit inventors in carrying the date of their inventions back to a period of not more than two years prior to the filing of the application. In this way, it is hoped to compel inventors to file their applications within two years after completion of their inventions.

H.R. 11,054, a bill to prevent fraud, deception, or improper practice in connection with business before the Patent Office. Some of the provisions of the bill are that it shall be unlawful for persons not registered in the Patent Office to act as patent attorney, or for non-members of the Bar to hold themselves out as patent attorney, lawyer, solicitor, or counseller. Corporations will not be allowed to practice before the Patent Office under the provisions of the act.

H.R. 11,087, a bill to abolish the renewal statute. The renewal statute permits an applicant to delay the issuance of his patent by forfeiting the application after it has been allowed and then filing a renewal application within a year after the original allowance. The bill also provides a means for adding claims to an allowed application by paying additional fees.

On October 19, 1932, Judge Nields at Wilmington, Del., handed down a decision regarding Mason's patent No. 1,663,505 for a hard grainless fiber product, which is expected to have a far reaching effect in certain branches of the paper industry. Bulletin No. 16 of the Patents Committee published on page 25 of the PAPER TRADE JOURNAL of December 1, 1932, gives a summary of the case.

The Commissioner of Patents recently issued a report for the fiscal year ending July 1, 1932, which indicates patent applications declined to 73,465 (a loss of more than 12.6 per cent). Curiously the number of patents granted increased 18.6 over the previous year. During the next fiscal year the number of applications is expected to drop further due to an increase in Patent Office filing and issuing fees to $30.00 each.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.
Annual development report of the Patents Committee of the Management Division of the TAPPI.

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Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Sulphite Process

Arrangement on Cellulose Digesters with Forced Circulation. Einar Morterud, Torderod, Norway. Czech. pat. 39,537.—Arrangement for the strainers of the circulation pumps.—J. F. O.

Gas Circulation in the Cooking of Sulphite Pulp. Wochbl. Papierfabr. 63, No. 43: 795 (Oct. 22, 1932).—A process has been worked out for the circulation of the gas in the cooking of sulphite pulp which offers the same or similar advantages as the circulation of the cooking liquor. The gas leaves the digester at the top and passes to an acid separator, thence to a compressor where the gas is forced into the bottom of the digester. Among the advantages are, a positive circulation of the liquor in the digester, a weaker acid can be used, shorter cooking time, etc.—J. F. O.

The Formation of Furfural in the Sulphite Cooking Process. Gerhard Spielmeyer. Papier-Fabr. 30, No. 47: 662 (Nov. 20, 1932).—During the cooking process, the pentosans go in to solution after the hexosanes, And in the sulphite waste liquor, furfural is found as the conversion product of pentosan. By means of the red coloration from the anilin reaction, the formation of furfural during the cooking process is studied.—J. F. O.

Comments Upon Sulphite Digester Circulation Methods. G. L. M. Hellstrom. Pulp Paper Can. 33: 491-493 (Dec., 1932).—The basic principles and difficulties inherent to the various types of sulphite circulation systems are briefly discussed. These difficulties have been overcome in the Hellstrom system by drawing the liquor, and whatever chips may follow, from the lower (or upper) part of the digester and introducing it again at the top (or bottom) of the digester, the former procedure being preferable.—A. P.-C.

Acid Penetration in Sulphite Pulping. Ralph B. Hansen and Svarre Hazelquist. Paper Trade J. 95, No. 20: 27-29 (Nov. 17, 1932).—Experiments are described from which it is concluded that penetration is not a deciding factor in the handling of sulphite digester, as it is nearly impossible to bring a commercial digester of any size to 110 deg. C. before penetration of the chips is complete, unless initial acid temperature is under 35 deg. C. —A. P.-C.

The Babcock & Wilcox-Kimberly-Clark Circulating and Indirect Heating System for the Sulphite Pulping Process. Lloyd Lang. Paper Trade J. 95, No. 22: 26-36 (Dec. 1, 1932).—A detailed illustrated description of the system developed and installed at the Kimberly mill, together with a discussion of the advantages which have been proved by its installation on one digester for two years and on five other digesters for one year.—A. P.-C.

Brief Description of the Pyrite Roasting Plant of the Pulp Mill of Hackman and Co. at St. Johannes, Finland. Pappers-Travarutid. Finland 14, no. 23:852-854, 856-858 (Dec. 15, 1932); Bull. Inst. Paper Chem. 3: 147.—Description of a pyrite roasting plant in a Finnish pulp mill, which was installed by the Lurgi, Germany. —C. J. W.

Kinetics of the Sulphite Cooking Process. E. Stangeland. Papir-J. 20, No. 16: 170-173; No. 18: 193-197; No. 20: 214-217; No. 24: 272-274 (Sept. 21, Oct. 27, Nov. 30, Dec. 31, 1932); Bull. Inst. Paper Chem. 3: 151.—The author describes his investigations and experiments relating to the reactions involved in the dissolution of incrustants during the cooking of chips by the sulphite process. He concludes that the velocity of diffusion is greater than the velocity of the various chemical reactions and must therefore be considered the decisive factor in the dissolution of the incrustants.—C. J. W.

Sulphite Waste Liquor

Utilization of Sulphite Waste Liquor. H. K. Benson. Paper Trade J. 95, No. 20:31-34 (Nov. 17, 1932).—A consideration of some of the technologic processes available for the conversion of sulphite waste liquor into other forms or possibly useful commodities.—A. P.-C.

Chemical Pulp Residual-Liquor Treatment. Linn Bradley and Edward P. McKeefe. U. S. pat. 1,877,219 (Sept. 13, 1932).—Sulphite waste liquor is treated with an addition of alkaline liquor formed by dissolving the sodium carbonate and sodium sulphide produced in another step of the process, the mixed liquors are rendered non-acid, and some sodium thiosulphate is formed in the mixture. It is then concentrated and solid constituents are subjected to a reducing furnace treatment to form a melt containing sodium carbonate and sodium sulphide, the latter compounds being dissolved and a portion of them used as already mentioned.—A. P.-C.

Concerning the Determination of the Total Sulphur in Pulp Waste Liquors. Margot Dorenfeldt. Papier Fabr. 30, No. 48: 673-76 (Nov. 27, 1932).—The methods of Schwalbe and Sieber for the determination of the total sulphur in sulphite waste liquor are analyzed and found to be wrong, details of the experiments to prove this are given. In conclusion the author describes his method for this determination.—J. F. O.

Arrangement for the Recovery of the Dry Substance from Sulphite Waste Liquor. P. G. Ekstrom, Stockholm. Swed. pat. 74,637 (July 24, 1930).—The liquor in a finely divided form, is passed through a stream of warm gas in a compartment of an oven for the separation of the water. The oven is specially built so that the evaporation of the liquor can take place at as low a temperature as possible, suitably at 150 deg. C.—J. F. O.

Arrangement for the Thickening of Sulphite Waste Liquor According to the Freezing Process. Karl Ehninger, Graz. Aust. pat. 126,600 (Sept. 15, 1931).—J. F. O.

Miscellaneous Digesting Process

Process for Obtaining a Pure Pulp. Papeteries Navarre Societe Anonyme, Lyons. Ger. pat. 562,181 (Sept. 4, 1931).—It has been found that a very pure pulp is produced with a high yield, if sodium carbonate solution without any other additional substance, at temperatures of 50 to 100 deg. C., that is, at atmospheric pres-

sure, is allowed to react with materials containing cellulose. The process is best carried out by allowing the liquor to flow counter current over the material to be cooked. Good results were obtained under the following conditions; an 8 per cent solution of sodium carbonate is used, temperature 90 to 100 deg. and the time of treating is 55 to 70 hours. The usual wood pulp for paper manufacture produced in this manner contains from 96 to 98 per cent alpha cellulose.—J. F. O.

Arrangement for the Production of Half Stock or Half Pulp. Carl Leyst Kuchenmeister, Berlin. Ger. pat. 562,770 (Nov. 24, 1928).—The raw material suspended in water is treated in a vertical cylindrical housing in which there is a quick revolving shaft to defiber the raw material.—J. F. O.

Process for the Manufacture of Pulp. Patentaktiebolaget Grondal-Ramen, Stockholm. Ger. pat. 553,966 (May 11, 1930).—The invention concerns the manufacture of pulp from chipped wood by an interrupted method and by the use of a digester with an agitator so that the fiber bundles can be de-fibered. The wood is first cooked until it is soft enough to be de-fibered by the agitator.—J. F. O.

Production of Paper Pulp. Wm. H. Mason, assignor to Masonite Corp. U. S. pat. 1,872,996 (Aug. 23, 1932).—Subdivided wood is treated with chemicals and after removal of surplus chemicals the material is subjected to steam pressure above 250 lb. per sq. in. in the treatment chamber and then discharged so as to effect explosive disruption.—A. P.-C.

Fiber Board. Robert G. Quinn, assignor to the International Paper Co. Can. pat. 325,758 (Sept. 6, 1932).—Fiber is intimately treated with ammonium phosphate, containing an excess of ammonia, and ammonium borate or boric acid and sized with non-inflammable waterproofing compounds. The fiber is shaped into board form, dried and treated with a solution of ammonia.—A. P.-C.

Process for the Manufacture of a Pulp with Very Little Resin. I. G. Farbenindustrie Akt. Ges. Frankfurt a.M. Ger. pat. 557,537 (April 13, 1930).—The object of the invention is to manufacture a pulp from raw materials rich in resin, such as pine wood, and obtain a pulp practically free from resin. The raw material is first treated with a 10 per cent or stronger solution of nitric acid so that it is nearly all decomposed, then treated with alkali and finally allowed to react in the moist condition with chlorine. About 1 to 8 per cent of chlorine is consumed, and a 5 to 10 per cent solution of caustic is used to dissolve out the hemicelluloses.—J. F. O.

Process for the Manufacture of Wood Pulp. G. Haglund, Stockholm. Swed. pat. 73,689 (May 14, 1929).—The cooking is carried out to such a degree that the stock can be mechanically de-fibered without weakening the stock.—J. F. O.

Process for the Treatment of Jute Fibers. N. T. Artificial Wool Co. Ltd., London, Swed. pat. 74,186 (Oct. 5, 1929).—According to its properties, the jute is treated from 2 to 5 days at a temperature of about 30 to 35 deg. C. with a liquor containing bacteria which was obtained through the fermentation of flax or hemp (or also both) with or without the addition of a suitable quantity of nutrient salts, such as potassium phosphate.—J. F. O.

Process for the Manufacture of Pulp. Carl L. Kuchenmeister, Berlin. Ger. pat. 564,553 (April 4, 1929). Addition to Ger. pat. 562,770.—In further carrying out the invention in patent 562,770, the stock so produced is then treated with alkali, acid or even neutral cooking solutions in the same machine.—J. F. O.

Process for the Manufacture of Pulp in Digesters with Outside Circulation of the Cooking Liquor for Shortening the Time of Dumping. A. Bol. Nordiska Armaturfabrikerna, Stockholm. Finn. pat. 14,453 (Feb 3, 1930).—A part of the liquid contents of the digester is drawn from the digester for the purpose of lowering the temperature of same and put into another container, and at the same time wholly or partly exchanged for a colder cooking liquor.—J. F. O.

Process for the Silicification of Fibrous Materials for the Production of Building Materials. Otto Stiner, Bern and Lignat Werke A. G. Grandson, Switzerland. Nor. pat. 50,432 (July 19, 1930).—J. F. O.

Process for the Manufacture of Cellulose. Einar Morterud, Torderod, Norway. Czech. pat. 39,532.—Sulphite or soda is sprinkled with a liquor in an enclosed container.—J. F. O.

Production of an Absorptive Pulp. Julius Kantorowicz, Breslau. Ger. pat. 558,796 (Sept. 21, 1930).—A raw cellulose produced in the usual manner is drenched in a mixture of 100 parts of 40 per cent formaldehyde and 2 parts of concentrated nitric acid and intimately mixed, then pressed and dryed at 120 deg. This water-proof cellulose is mixed with untreated raw cellulose in the ratio of 4 to 1 and used for the manufacture of paper, board and other pulp products.—J. F. O.

Process for the Manufacture of Finely Divided Wood Pulp. Arthur St. Klein, Berlin. Ger. pat. 559,405 (Sept. 23, 1927).—Pulp fibers are held at a pressure of at least 10 atmospheres with or without decomposing chemicals, and then the pressure is suddenly released.—J. F. O.

Process for the Complete or Partial Decomposition of Raw Materials Carrying Fibers and Derived from an Animal or Vegetable Source. Aktis Patent Verwertungsgesellschaft m.b.H., Berlin. Aust. pat. 127,356 (Nov. 15, 1931).—By means of a high frequency power field, raw materials carrying fibers and derived from an animal or vegetable source can be defibered and decomposed. The raw material is suspended in water to which bases, acids or salts are added to increase the conductivity.—J. F. O.

Pulps

The Relative Stabilities of Rag and Purified Sulphite Pulps. Harry F. Lewis. Paper Trade J. 95, No. 21: 29-42 (Nov. 24, 1932).—A report and discussion of the results obtained to date in an investigation of the chemical stabilities of selected rag, alpha and super-alpha pulps towards heat, acids, alkalies and light.—A. P.-C.

The Problem of Classification of Chemical Pulps. C. C. Heritage. Paper Trade J. 95, No. 23: 41-44 (Dec. 8, 1932).—Attention is drawn to the use requirements of pulps and the division of pulps into classes as basic to the problems involved in evaluation and specification, and a tentative scheme of classification is suggested.—A. P.-C.

Pulp Classification and Specifications. Paper Trade J. 96, No. 1: 37-50 (Jan. 5, 1933).—A stenographic report of the symposium on pulp classification and specifications held during the T.A.P.P.I. meeting, Holyoke, Sept. 15, 1932.—A. P.-C.

Process and Device for the Purification of Pulp. Papeteries Navarre Societe Anonyme, Lyon, France. Ger. pat. 556,838 (Feb. 29, 1928).—The purpose of the invention is to produce a pulp with 98 per cent alpha cellulose.—J. F. O.

Process for the Purification of Pulp After the Cooking by Washing with Water. Zellstoffffabrik Waldhof, Mannheim. Ger. pat. 557,768 (Jan. 28, 1930).—After or during the washing, water is introduced from beneath and allowed to pass up through the pulp and then it is led away by means of a trough extending around the blow pit. In

this manner the foam present aids in carrying away impurities and gives a cleaner pulp.—J. F. O.

Beating

Treatment of Waste Paper Stock. Herbert W. Server. U. S. pat. 1,882,194 (Oct. 11, 1932).—The waste paper is passed successively through a breaker beater, cooking tanks, rifflers, two sets of screens and finally through a series of bleaching towers. The main feature of the invention consists in the addition of beaten unbleached sulphite or sulphate pulp at some point intermediate the breaker beater and the bleaching towers, preferably after the second set of screens.—A. P.-C.

Rod Mill. H. Mallichk. Belg. pat. 387,415 (April 30, 1932).—A suitable number of spiders are provided to divide the mill into compartments, so that the bars are kept within their respective compartments.—A. P.-C.

The Design, Construction and Costs of Arc-Welded Pebble Mills. D. L. Pellett. Paper Trade J. 95, No. 25: 27-30 (Dec. 22, 1932).—A discussion of the design, stress analysis and manufacturing costs of an arc-welded pebble mill justifying its selection in preference to the riveted shell with cast iron heads.—A. P.-C.

Comminution of Fibers. P. Schidrowitz, R. M. Ungar and M. W. Philpott. Brit. pat. 379,099 (Aug. 28, 1931).—To reduce the tendency to slip on the rolls, the fibers are pre-treated with a natural or artificial aqueous dispersion, vulcanized or unvulcanized, of rubber, guttapercha or balata, or with a solution or dispersion of gelatin, rosin, cellulose ester, glucose, gum arabic or dextrin, and dried at 150 deg. C.—A. P.-C.

Breaker Beaters. H. L. Muller. Papeterie 54: 1125-1129 (Oct. 25, 1932).—A brief discussion of their action and explanation of the method of calculating the power requirements.—A. P.-C.

Process of and Apparatus for Treating Fibrous Material. Fritz Hoyer, assignor to A. G. fur Halbzellstoff-Industrie. U. S. pat. 1,886,020 (Nov. 1, 1932).—The material is mixed with water at not over 80 deg. C.; the mixture is carried at high velocity and with the aid of centrifugal force generated within the mixture against cutting elements; steam is introduced to raise the temperature to not over 80 deg. C. and motion of the mixture against the cutting elements is continued until the fibers have been separated from one another. The apparatus consists of a vertical cylindrical tank provided with a rapidly rotating vertical shaft on which are mounted horizontal cutting arms passing between stationary cutting blades fixed to the wall of the tank.—A. P.-C.

Important Facts in the Operation of a Beater. H. Mallichk, Wochbl. Papierfabr, 63, No. 47: 860-63 (Nov. 19, 1932).—The author divides the work of the beater into beating and rearranging. The fibrillation and the shortening of the fiber comes under the actual beating, while the separation of the individual fibers and the mixing is classed as rearranging. An example is given showing the amount of work done in the beater in each case. The favorable conditions in the construction of a beater are given, with reference to the kind of paper to be made.—J. F. O.

Beating

Screening or Refining of Ground Wood. A. Schahle. Wochbl. Papierfabr. 63, No. 42: 778-79 (Oct. 15, 1932).—Since bundles of fibers cannot be avoided in the grinding of wood, unless there is present in the stock considerable wood meal, a refiner is necessary. The submerged screens (Bird, Apmew, Trimbey) are better than the centrifugal. —J. F. O.

The "Banning Beater." Helmuth Banning. Wochbl. Papierfabr. 63, No. 42: 776-78 (Oct. 15, 1932).—In the ordinary beater, the kinetic energy given to the stock at the roll is practically all lost; but with the "Banning beater" the full amount of this energy is utilized. It has been found that by placing the bed plate at the side of the roll and by limiting the space between the bed plate and back fall, the stock can be thrown to a greater height. The advantages of this beater are, a wide roll of small diameter can be used and still circulate the stock at high speeds and with less power, good mixing of the stock, saving of space by being able to remove the bed plate from the rear, etc. —J. F. O.

Further Reports on the Hydration of Pulp in the Manufacture of Paper. J. Strachan. Papier-Fabr. 30, No. 43: 616-618; No. 44: 625-27; No. 45: 638-41; No. 46: 652-54 (Oct. 23, 30, Nov. 6, 13, 1932).—The chemical theory of the hydration of pulp is dead. The topics discussed are, fibrillation and strength, the significance of "hydration," the tester for the degree of beating, the crystal theory of the felting together, the specific surface and the outer specific surface, fibrillation and swelling, hydration and adsorption, surface adsorption on the fiber, and the structure of the fiber cellulose. The original of this treatise appeared in Paper Maker, 83: No. 3 (1932). —J. F. O.

Beater with a Bed Plate Capable of Swinging Around an Axis. Edouard Hery, Paris. Ger. pat. 556,122 (May 3, 1930).—J. F. O.

Arrangement for Converting Half-Stuff Into Finished Stock in a Continuous Process. Maschinenfabrik Agt. Ges. Kothen. Ger. pat. 557,411 (Sept. 13, 1928).—A rod mill is arranged above one or more mixers or beaters so that a continuous circulation can be maintained.—J. F. O.

Device for Regulating the Capacity and Degree of Beating of Rod Mills. J. M. Voith Maschinenfabrik, Heidenheim. Ger. pat. 557,714 (Aug. 12, 1930).—The outlet for the stock is arranged in a special manner.—J. F. O.

Breaker Beater. Anton D. Kuhn, Bad Liebenwerda. Ger. pat. 564,554 (Feb. 27, 1931).—J. F. O.

Arrangement for Regulating the Course of the Roll Pressure in Beaters. Viktor Piatnuk, Vienna. Aust. pat. 129,605 (April 15, 1932).—J. F. O.

Device for De-fibering Pulp or Similar Materials. K. Hellner, Falun, Swed. pat. 74,638 (Dec. 11, 1928).—Operation and construction so carried out to break up the stock.—J. F. O.

Bleaching

Bleaching Groundwood. Wilhelm Hirschkind, assignor to Great Western Electro-Chemical Co. U. S. pat. 1,873,924 (Aug. 23, 1932).—Groundwood is agitated at about room temperature for about 10 min. with an aqueous solution containing sodium hyposulphite as substantially the only active agent and in the proportion of about 0.25 to 10 per cent of the weight of the pulp, without subsequent washing.—A. P.-C.

Bleaching Paper Pulp. Hans John, assignor to Paper Patents Co. U. S. pat. 1,872,743 (Aug. 23, 1932).—Partial bleaching is effected with a bleaching agent such as chlorine under conditions of acid reaction, and then, after washing, the material is subjected to a bleaching operation with an agent such as chlorine under alkaline conditions.—A. P.-C.

Studies in the Bleaching of Wood Pulp. VI. Report. Concerning the Influence of the Bleaching Process on Chemical Physical Properties of Soda Pulp. Hermann Wenzl. Tech. Chemie Papier Zellstoff Fabr. 29, No. 4: 51-59 (Aug. 27, 1932).—The author describes each experiment in detail, giving much pertinent data and numerous curves. It can be shown that there must be a difference

between the total acidity and the "active acidity" of the bleach bath and that both are of great importance to the quality of the bleached pulp during the course of bleaching. The cause of the observed great difference of the acidity relation during the bleaching is the carbon dioxide split off from the pulp by the oxydation reaction.—J. F. O.

Process for the Recovery of Dry, High Valent Calcium Hypochlorite. I. G. Farbenindustrie, Frankfurt a.M. Ger. pat. 550,907 (Oct. 29, 1929).—A substance is added to the calcium hypochlorite solution which makes it slightly alkaline but lasting, and the solution is then quickly evaporated to dryness under normal atmospheric pressure by finely dividing it, for example, by spraying the solution in hot air.—J. F. O.

Process for the Manufacture of Stable Bleach Liquor Containing Active Oxygen. Max Schaidhauf, Durach. Ger. pat. 557,949 (Nov. 14, 1929).—Solutions of alkali carbonates are electrolyzed in the usual manner and before, during or after the electrolysis, caustic alkali, such as sodium hydroxide, etc. is added.—J. F. O.

Double-walled Tank for Bleaching. Deutsche Gold und Silber Scheideanstalt vorm. Roessler, Frankfurt a.M. Ger. pat. 558,146 (Sept. 4, 1928).—J. F. O.

Production of a Stable Concentrated Alkali Hypochlorite Solution. Sanosa G.m.b.H. Berlin, Ger. pat. 565,896 (March 19, 1931).—Alkali liquors are treated, under the addition of salts of such metals that form hydroxides of an amphoteric nature with chlorine and separated from this as soon as a separation of hydroxide of the named metals takes place.—J. F. O.

Process for the Bleaching with Hypochlorites. Hermann Wenzl, Gretesch, Ger. pat. 565,535 (Dec. 4, 1930). Addition to Ger. pat. 498,856.—The alkalinity of the bleach bath is maintained during the entire course of the reaction.—J. F. O.

Process for the Bleaching of Bast Fibers, Especially Flax, Hemp and Similar Materials. I. G. Farbenindustrie A. G. Frankfurt a.M. Swed. pat. 74,595 (Feb. 4, 1930).—The raw fibers are treated alternately with hydrogen peroxide and chlorine baths in the following order, hydrogen peroxide, chlorine (acid), washing with soda solution chlorine (alkaline to neutral), hydrogen peroxide.—J. F. O.

Process for the Continuous Bleaching of Paper Stock or Other Fibrous Materials. Emil Ekeberg, Konga, Sweden. Finn. pat. 14,193 (Aug. 16, 1930).—The materials drenched with bleach liquor are deposited on a conveyor which moves with a constant speed and after a certain distance is removed and treated further. Since the stock is not subjected to mechanical action, hydration and similar destruction is avoided.—J. F. O.

Arrangement for the Continuous High Density Bleaching of Paper Stock and Similar Materials. E. Ekeberg, Konga. Swed. pat. 74,833 (Sept. 6, 1929).—J. F. O.

Process for the Bleaching of Textile Goods and Fibrous Materials of all Kinds with Hydrogen Peroxide. Elektro Chemische Werke Muchen A. G. Munich. Ger. pat. 561,481 (Feb. 26, 1927).—The fibrous material is drenched with a solution sufficiently alkaline and to which hydrogen peroxide has been added. High temperatures are used in such a way that there is no evaporation.—J. F. O.

Process for Making Peroxides Stable, Especially for Bleaching Purposes. Oranienburger Chemische Fabrik Akt. Ges. Berlin. Ger. pat. 561,603 (Sept. 10, 1929).—Small quantities of hydrogenating products of benzol, toluol, xylos, naphthalene or similar substances or derivatives, are added in the form of water soluble or water miscible state as stabilizing agent, that is, in regulating the giving off of oxygen.—J. F. O.

Dyes

Process for the Coloring of Paper, Board and Similar Materials. I. G. Farbenindustrie Akt. Ges. Frankfurt a.M. Ger. pat. 555,033 (Oct. 15, 1929).—The sodium salt of the condensation product of beta naphthalene sulpho acid and formaldehyde which has been neutralized with sodium bisulphate and dissolved in water is added to the paper stock in the beater in a quantity of ½ to 1 per cent. Thereafter the stock is colored in the usual manner and sized.—J. F. O.

Process for Changing the Dyeing Properties of Plant Fibrous Materials. Heberlein & Co. A. G., Wattwil, Switzerland. Ger. pat. 555,372 (July 15, 1925).—The fibrous materials are treated with the halogen compounds of phosphorous in the presence of alcoholic alkali liquor.—J. F. O.

Sizing

The Use of Ammonium Alginate in Paper and Board Making. Anon. Papeterie 54: 1122 (Oct. 25, 1932).—A brief outline of its properties and merits for use in the manufacture of paper and board.—A. P.-C.

Graphical Study of the Stages of Sizing. G. M. Papeterie 54: 1106-1113, 1158-1163, 1222-1229 (Oct. 25, Nov. 10, 25, 1932).—A discussion, explained by means of graphs, showing the effects of variations of each of the factors of sizing.—A. P.-C.

Sizing Paper Containing an Alkaline Filler. Raffold International Corp. Brit. pat. 378,024 (May 1, 1931).—Paper loaded with an alkaline filler can be satisfactorily sized with rosin if the filler, the alum, or a mixture of the two, is added to the diluted pulp just before it reaches the paper machine. Alternatively, the size, alum and filler may all be added at this point. Other variations are possible so long as the time of contact of the filler with the size-alum complex prior to sheet formation is reduced to a minimum.—A. P.-C.

The Problem of Sizing Stock. F. Arledter. Papier-Fabr. 30, No. 45: 641-43 (Nov. 6, 1932).—Polemic over the theories of sizing. The author believes that the size of the particle should not be too large or too small and as with the free rosin content should be determined by the different conditions at the individual mills. In a mechanical physical sense, sizing is the combination of the flock formation from the soap and the electrical precipitation of the free rosin particles. In the sense of the ionic theory of Svante Arrhenius, the resinate solution is already hydrolyzed or ionized, therefore rosin is present as ions.—J. F. O.

Process for the Manufacture of Solid Rosin Size, Especially for the Manufacture of Paper. Wilhelm Schafer, Wiener-Neustadt. Aust. pat. 126,434 (April 15, 1931).—Rosin which can be saponified, is saponified with alkali under the use of as little water as possible and in the presence of a protective colloid; to such an extent that a sample becomes solid after cooling and is strongly insoluble in water, that is, a rosin size capable of being emulsified.—J. F. O.

Process for the Sizing of Paper. Ernst Lecocq & Stree Marchin, Belgium. Czech. pat. 38,399.—Forty grams of alkali resinate are dissolved in a liter of hot water and this solution is put into a beater containing 200 kilograms stock. A solution containing 200 grams of alkali bisulphate is then added to the beater and finally a solution containing 180 grams aluminum sulphate.—J. F. O.

Application of Nephelite in Paper Industry. N. Perekalskii. Bum. Prom. 11, No. 10: 7-16 (1932); C. A. 27: 596.—Experiments in substitution of nephelite for clay in sizing of paper are described—C. J. W.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JULY 22, 1933

CIGARETTE PAPER

American Tobacco Co., Lafayette, Havre, 250 cs.; Champagne Paper Corp., Lafayette, Havre, 58 cs.; Standard Products Corp., Lafayette, Havre, 60 cs.; De Manduit Paper Corp., Pr. Roosevelt, Havre, 138 cs.

NEWS PRINT

W. H. Bell, Markland, Liverpool, N. S., 4585 rolls; Jay Madden Corp., Scanmail Kotka, 587 rolls; ——, Scanmail, Kotka 154 rolls; Perkins Goodwin & Co., Berlin, Bremen, 406 rolls; —— Tyrifjord, Oslo, 78 rolls; News Syndicate Co., Inc., Belvoir, Thorold, 2878 rolls; Jay Madden Corp., Cliffwood, Wiborg, 376 rolls; Perkins Goodwin & Co., Hamburg, Hamburg, 60 rolls.

PRINTING PAPER

Jay Madden Corp., Scanmail, Wiborg, 30 bls., 66 rolls; Japan Paper Co., Berlin, Bremen, 1 cs.; —— Berlin, Bremen, 27 cs.; Ozalid Corp., Statendam, Rotterdam, 22 cs.; Steiner Paper Corp., Statendam, Rotterdam, 24 cs.

WRAPPING PAPER

Van Oppen Co., Pr. Polk, Genoa, 13 cs.; E. Dietzgen & Co., Statendam, Rotterdam, 8 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., American Banker, London, 6 cs.

DRAWING PAPER

Schenker & Co., Milwaukee, Hamburg, 1 cs.; M. Grumbacher, Statendam, Rotterdam, 1 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Minnetonka, Antwerp, 23 cs.; P. C. Zuhlke, Minnetonka, Antwerp, 1 cs.; Globe Shipping Co., Berlin, Bremen, 61 cs.

METAL COATED PAPER

Globe Shipping Co., Hamburg, Hamburg, 2 cs.

COATED PAPER

Chas. Happel, Hamburg, Hamburg, 1 cs.; ——, Hamburg, Hamburg, 3 cs.

PHOTO PAPER

Medo Photo-Supply Co., Majestic, Southampton, 1 cs.; J. J. Gavin, Majestic, Southampton, 3 cs.

BASIC PAPER

Globe Shipping Co., Berlin, Bremen, 1 cs.

COLORED PAPER

Borden Riley Paper Co., Minnetonka, Antwerp, 1 cs.; P. H. Petry & Co., Berlin, Bremen, 8 cs.

DECALCOMMANIA PAPER

B. F. Drakenfeld & Co., Scythia, Liverpool, 15 cs. (duplex); 2 cs. (simplex).

DECALCOMANIAS

Sellers Transportation Co., Europa, Bremen, 23 cs.

TRANSFER PAPER

Rohner Gehrig & Co., Columbus, Bremen, 3 cs.; Rohner Gehrig & Co., Europa, Bremen, 4 cs.

TISSUE PAPER

Jay Madden Corp., Scanmail, Kotka, 16 bbls.; B. F. Drakenfeld & Co., Scythia, Liverpool, 2 cs.

ENVELOPES

Beckhard Simfred Co., Berlin, Bremen, 1 cs.

LITHO PAPER

Bernhard Meiners, Jeff Davis Canton, 15 cs.

VELLUM PAPER

——, Rex, Genoa, 3 cs.

COVER PAPER

International F'd'g. Co., Milwaukee, Hamburg, 8 cs.

STRAW BOARDS

Favorite Paper-Box Co., Statendam, Rotterdam, 1560 pkgs.; H. Fuchs & Son, Statendam, Rotterdam, 18 bls.; R. Wilson Paper Corp., Statendam, Rotterdam, 160 rolls.

IVORY BOARD

R. Wilson Paper Corp., Statendam, Rotterdam, 55 cs.

MISCELLANEOUS PAPER

International F'd'g. Co., Black Falcon, Antwerp, 6 cs.; ——, Minnetonka, Antwerp, 8 cs.; Japan Paper Co., Pr. Wilson, Kobe, 8 cs.; Standard Products Corp., Pr. Wilson, Yokohama, 4 cs.; T. N. Fairbanks, Pr. Wilson, Yokohama, 2 cs.; F. C. Strype, Milwaukee, Hamburg, 4 cs.; Keller Dorian Paper Co., Lafayette, Havre, 3 cs.; C. Schleicher & Schull Co., Pr. Roosevelt, Hamburg, 6 bls.; Corn Exchange Bank Trust Co., Sanyo Maru, Kobe, 33 cs.; T. N. Faiebanks, Sanyo Maru, Yokohama, 2 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., Black Falcon, ——, 148 Bls. bagging; A. H. Searle, Black Falson, Antwerp, 858 bls. rags; E. J. Keller Co., Inc., Exiria, ——, 340 bls. rags; ——, Exiria, Barcelona, 269 bls. bagging; Amtorg Trading Corp., Scanmail, Leningrad, 1300 bls rags; E. J. Keller Co., Inc., Cypria, ——, 416 bls. rags; Brown Bros., Harriman & Co., Cypria, Barcelona, 125 bls. rags; Chase National Bank, Cypria, Barcelona, 30 bls. rags; Bank of N. Y. Trust Co., Cypria, Barcelona, 161 bls. rags; ——, Scythia, Liverpool, 52 bls. rags; ——, Cliffwood, Stettin, 272 bls. rags; Flintkote Co., Statendam, Rotterdam, 128

bls. rags; Armstrong Cork Co., Statendam, Rotterdam, 295 bls. rags; Johns Manville Corp., Statendam, Rotterdam, 227 bls. rags; Castle & Overton, Inc., Montreal City, Bristol, 228 bls. rags, 130 bls. bagging; ——, Montreal City, Bristol, 166 bls. bagging; Van Oppen & Co., Pr. Roosevelt, Hamburg, 294 bls. bagging; Corn Exchange Bank Trust Co., Sanyo Maru, Kobe, 125 bls. rags.

CASEIN

Chemical Bank Trust Co., Amer. Legion, B. Ayres, 500 bags; Chasein Manfg. Co., Amer. Legion, B. Ayres, 1884 bags; D. C. Andrews & Co., Hamburg, Hamburg, 70 bags.

HIDE GLUE

——, Berlin, Bremen, 85 bags.

CHINA CLAY

L. A. Salomon & Bro., Scythia, Liverpool, 840 bags, 46 tons; Whitaker Clark & Daniels, Scythia, Liverpool, 280 bags, 10 tons

OLD ROPE

E. J. Keller Co., Inc., Exiria, ——, 173 coils; S. Birkenstein & Son, Cypria, Barcelona, 76 coils; Bank of N. Y. Trust Co., Cypria, Barcelona, 77 coils; A. S. Wilson, Inc., American Banker, London, 95 coils; A. S. Wilson, Inc., Scythia, Liverpool, 84 coils; Banco Coml Italiane Trust Co., Scythia, Liverpool, 109 coils; Banco Coml Italiane Trust Co., Cristobal Colan, Pasajes, 138 coils; Banco Coml Italiane Trust o., Cristobal Colon, Santander, 70 coils; W. Steck & o., Statendam, Rotterdam, 46 coils; G. W. Millar & Co., Inc., Montreal City, Bristol, 253 coils; A. S. Wilson Inc., Montreal City, Bristol, 168 coils.

WOOD PULP

Lagerloef Trading Co., Scanmail, Wiborg, 2540 bls. sulphite 477 tons; ——, Scanmail Kota, 1574 bls sulphite 269 tons; E. J. Keller Co., Inc., Scanmail, ——, 336 bls. wood pulp 50 tons; Atterbury Bros., Inc., Tyrifjord, Skien, 2000 bls. mechanical pulp; J. Andersen & Co., Tyrifjord, Oslo, 2333 bls. sulphite; Lagerloef Trading Co., Clifford, Wiborg, 1524 bls. mechanical pulp 304 tons; Lagerloef Trading Co., Clifford, Wiborg, 2540 bls. sulphite 459 tons; Castle & Overton, Inc., Clifford, Wiborg, 2514 bls. wood pulp 503 tons; Price & Pierce, Ltd., Clifford, Wallvik, 3600 bls. sulphate 600 tons; Price & Pierce, Ltd., Clifford, Wallvik, 1800 bls. sulphite 300 tons; Price & Pierce, Ltd., Clifford, Wallcik, 250 bls. mechanical pulp 50 tons; Pagel Horton & Co., Inc., Clifford, Husum, 611 bls. sulphite 100 tons; A. Giese & Son, Statendam, Rotterdam, 25 bls. wood pulp; Johaneson Wales & Sparre, Inc., Toledo, Hernosand, 1350 bls. sulphite; J. Andersen & Co., Toledo, Stugsund, 665 bls. sulphate; Bulkley Dunton & Co., Toledo, ——, 3375 bls. wood pulp; Johaneson Wales & Sparre, Inc., Toledo, Sundsvall, 2325 bls. sulphite; Johaneson Wales & Sparre, Inc., Toledo, Sundsvall, 670 bls. chemical pulp; Johaneson Wales & Sparre, Inc., Toledo, Sundsvall, 300 bls sulphate; Mead Sales Co., Toledo, Sundsvall, 250 bls sulphite; 1st Natl Bank of Boston, Pr. Roosevelt, Hamburg, 504 bls. wood pulp; Castle & Overton, Inc., Hamburg, Hamburg, 1600 bls wood pulp, 320 tons; Gottesman & Co., Inc., Gripsholm, Gothenburg, 1200 bls. wood pulp; Bulkley Dunton & Co., A. Ballin, ——, 125 bls. wood pulp.

WOOD PULP BOARDS

Heidelbach Ickelheimer & Co., Statendam, Rotterdam, 72 bls.; Johaneson Wales & Sparre, Inc., Belgium Maru, Hamburg, 1165 rolls, 247 tons.

ALBANY IMPORTS

WEEK ENDING JULY 22, 1933

Atterbury Bros. Inc., Tyrifjord, Tofte, 3050 bls. sulphite; Bulkley Dunton & Co., Toledo, ——, 3750 bls. wood pulp; Johaneson Wales & Sparre, Inc.; Toledo, Suudsvall, 1800 bls. sulphite; Bulkley Dunton & Co., Belos, ——, 3600 bls. wood pulp; Bulkley Dunton & Co., Karpfanger, ——, 3375 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING JULY 22, 1933

Bulkley Dunton & Co., Karpfanger, ——, 7500 bls. wood pulp; Gottesman & Co. Inc., Bockenheim, Sweden, 2550 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING JULY 22, 1933

Oxford University Press, Scythia, Liverpool, 4 cs printing paper; G. F. Malcolm Co., Scythia, Liverpool, 25 cs. tissue paper; Bulkley Dunton & Co., Capulin, ——, 1125 bls. wood pulp; Bulkley Dunton & Co., Haimon, ——, 250 bls. wood pulp.

WILMINGTON IMPORTS

WEEK ENDING JULY 22, 1933

Price & Pierce, Ltd., Clifford, Orviken, 6000 bls. chemical pulp, 1000 tons.

PHILADELPHIA IMPORTS

WEEK ENDING JULY 22, 1933

——, Exiria, Alexandria, 250 bls. rags; Lagerloef Trading Co., Scanmail, Kota, 983 bls. wood pulp boards 109 tons; J. W. Hampton, Scanmail, Kota, 112 rolls news print; J. Lang Paper Co., Scanmail, Stettin, 118 bls. rags; R. Blank, Scanmail, Stettin, 96 bls. rags; Jay Madden Corp., Scanmail, Kota, 47 bls. tissue paper; Chase National Bank, Cypria, Marseilles, 266 bls. rags; Bank of N. Y. Trust Co., Cypria, Barcelona, 54 coils old rope; Natl Vulcanized Fibre Co., Cypria, Barcelona, 118 bls. rags; Castle & Overton, Inc.; Clifford, Wiborg, 130 bls. wood pulp 26 tons; Price & Pierce, Ltd., lifford, Wallvik, 300 bls. sulphite 50 tons; Price & Pierce, Ltd., Clifford Wallvik, 250 bls. mechanical pulp 50 tons; Bulkley Dunton & Co., Clifford, ——, 250 bls. chemical pulp 50 tons; Atterbury Bros. Inc., Clifford, Wallvik, 800 bls. mechanical pulp 133 tons; Pagel Horton & Co., Inc., Clifford, Husum, 6000 bls. sulphate 1000 tons; J. Lang Paper Co., Clifford, Stettin, 510 bls. rags; Johaneson Wales & Sparre, Inc., Toledo, Sundsvall, 2040 bls. sulphite; Johaneson Wales & Sparre, Inc., Toledo, Sundsvall, 180 bls. sulphate; Mead Sales Co., Toledo, Sundsvall, 546 bls. sulphite; Gottesman & Co., Inc., Ottowa, Sweden, 6000 bls wood pulp.

CAMDEN IMPORTS

WEEK ENDING JULY 22, 1933

Johaneson Wales & Sparre, Inc., Toledo, Obbola, 175 bls. sulphate; Continental Bank Trust Co., Toledo, Hernosand; 450 bls. sulphate.

BALTIMORE IMPORTS

WEEK ENDING JULY 22, 1933

National City Bank, Cypria, Marseilles, 340 bls. rags; ——, Cypria, Barcelona, 378 bls. rags; Gottesman & Co., Inc., Bockenheim, Sweden, 2600 bls. wood pulp; Gottesman & Co. Inc., Mexicano, Sweden, 1810 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING JULY 22, 1933

Bulkley Dunton & Co., Toledo, Soderhamn, 2200 bls. sulphate.

NEW ORLEANS IMPORTS

WEEK ENDING JULY 22, 1933

Gottesman & Co. Inc., Raimund, Sweden, 246 bls. wood pulp.

SAVANAH IMPORTS

WEEK ENDING JULY 22, 1933

Manufacturers Trust Co., Sanyo Maru, Shanghai, 206 bls. bagging.

LATEST MARKET REVIEW

New York Market Review

Office of the PAPER TRADE JOURNAL
Wednesday, July 26, 1933.

Trading in the local paper market continues quite active for the time of year. Demand for practically all the various standard grades of paper is fairly persistent. Sales forces of the leading paper houses are optimistic regarding the future. Quotations are just now generally steady to firm.

The news print paper market is arousing more interest. Production in the United States, Canada and Newfoundland is being maintained in sufficient volume to take care of current requirements. The price situation is unchanged, but it is hoped that the adoption of a code for the industry will eventually lead to stabilization.

Paper board operations are proceeding at near capacity. Demand for box board is holding up well and prices continue steady to firm. The fine paper market is exhibiting an upward trend. Tissues are stronger. The coarse paper market is sharing the general improvement and kraft prices are slightly higher.

Mechanical Pulp

The ground wood pulp market is displaying strength. Production of mechanical pulp, both domestic and imported, is practically keyed to consumption. Accumulations are not excessive and the industry is considered in a sound statistical position. Prices are holding to schedule, without difficulty.

Chemical Pulp

Further advances were reported in the local chemical pulp market. No. 2 imported strong unbleached sulphite is now quoted at from $1.70 to $1.80, on dock, Atlantic ports. Domestic and Canadian easy bleaching sulphite is offered at from $1.80 to $1.90 and news at from $1.70 to $1.80, f.o.b. pulp mill.

Old Rope and Bagging

The old rope market continues firm. Both domestic and imported old manila rope are exhibiting a strong undertone. Small mixed rope is moving in good volume. The bagging market is moderately active. Scrap and gunny bagging are practically marking time. Roofing bagging is rather quiet.

Rags

Paper mill demand for the various grades of domestic rags has quieted down somewhat. However, new cotton rags are going forward in satisfactory volume, especially No. 1 white shirt cuttings. Roofing grades are slightly softer. The imported rag market is quite irregular due in a great measure to foreign exchange fluctuations.

Waste Paper

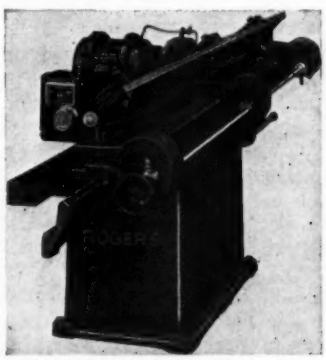
There is still a certain liveliness in the paper stock market. Board mill request for the lower grades is persistent. Offerings are limited, however, and recently advanced prices are well maintained. No. 1 mixed paper and strictly folded news are particularly firm. The better grades of waste paper continue steady.

Twine

Business in the local twine market is fairly active for the season. Influenced by the improved demand for wrapping paper, the various grades of twine are moving into consumption in good volume. Despite keen competition which is now going on for extra desirable orders, prices on twine are holding fairly well to formerly quoted price levels.

New Automatic Knife Grinder

The New Type "M" Rogers Grinder, a completely motorized and self contained unit, marks the most advanced development in the low price field for years. It



is properly engineered, wholly automatic, and built to modern standards of excellence. It will sharpen the average knife in from 15 to 20 minutes and is guaranteed to give absolute satisfaction.

By means of a special ingenious electric timing device or clock, the grinding operation, including cross feeding and table traverse is automatically controlled. It can be set to cut off the power and stop grinding automatically at the end of any period from 1 to 45 minutes.

At the end of each table traverse or stroke the rotation of the grinding wheel instantly and quietly reverses. This changes of wheel rotation produces sharp knives with smooth bevels and without wire edges.

The new grinder has General Electric ball bearing 60 cycle motor with oil emersed reversing and magnetic switches attached. This new modern design eliminates cross belts, tight and loose pulleys, shifting levers and other parts, necessary in other designs, and insures smoother operation and lower manufacturing and maintenance costs.

Additional information regarding the new grinder may be obtained from Samuel C. Rogers & Co., 191-205 Dutton avenue, Buffalo, N. Y.

Paper Manufacturers Co. Increases Wages

PHILADELPHIA, Pa., July 21, 1933.—The Paper Manufacturers Company, Inc., of Fifth and Willow streets, Philadelphia, announce that due to increased volume of business and consequent increase in profits, they are increasing the wages of their employees ten per cent, following out the spirit of the National Industrial Recovery Act.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, July 26, 1933.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3 to 3½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Trading in the bleaching powder market is moderately active. Contract shipments are moving in fairly good volume. Prices remain steady and unchanged. Bleaching powder is selling at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues firm. Domestic standard ground is quoted at 13¼ cents and finely ground is selling at 14 cents per pound. Argentine standard ground is selling at 13¼ cents and finely ground at 14¼ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is persistent. The contract movement is well up to average. Solid caustic soda is quoted at from $2.55 to $3.00; while the flake and the ground are selling at from $2.95 to $3.00 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is somewhat irregular, due to currency fluctuations. Imported china clay is still quoted at from $12 to $17 per ton, ship side; while domestic paper making clay is now selling at from $4.50 to $12.00 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. Shipments against contract are going forward to the paper mills in good volume. Prices are firm. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is softer. Grades of gum rosin used in the paper mills are now quoted at from $5.35 to $5.40 per 280 pounds, in barrels, at works; while wood rosin is selling at $4.20 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Paper mill demand for salt cake is fairly heavy. Prices continue firm. Salt cake is quoted at from $14 to $14.50; chrome salt cake at from $13.50 to $14 per ton, at works; while imported salt cake is selling at from $14 to $14.50 per ton, on dock.

SODA ASH.—Conditions in the soda ash market are satisfactory. Demand from the paper mills is well sustained. Prices are firm. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.30; and in barrels, $1.43.

STARCH.—In sympathy with the basic grain market, quotations on starch are fluctuating. Contract shipments are moving with regularity. Special paper making starch is now quoted at $2.84 per 100 pounds, in bags; and at $3.11 per 100 pounds in barrels at works.

SULPHATE OF ALUMINA.—Business in the sulphate of alumina market is buoyant. Prices are holding to schedule. Commercial grades are still quoted at from $1.25 to $1.46; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market rules steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—No radical changes have transpired in the talc market. Supplies are moving into consumption at a normal pace. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines; while foreign talc is selling at from $20 to $50 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	00
Writings—			
Extra Superfine	6.50	@	10.00
Superfine	6.25	@	14.75
Tub sized	4.50	@	7.00
Engine sized	4.00	@	5.00
Book, Cased—			
S. & S. C.	4.50	@	5.25
M. F.	4.35	@	4.85
Coated and Enamel	5.25	@	9.50
Lithograph	5.10	@	9.50
Tissues—Per Ream—			
White No. 1	.60	@	.80
White No. 2	.55	@	.70
Anti-Tarnish M. G. only	.75	@	.80
Colored	.80	@	1.00
Kraft	.75	@	.80
Manila	.65	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.11	@	—
No. 2	.10	@	—
Bleached, basis 20 lbs.	.13	@	—

(Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Side Runs	25.00	@	—
Kraft—			
No. 1 Domestic	4.50	@	4.75
No. 2 Domestic	3.50	@	3.75
Southern	3.50	@	3.75
Imported	Nominal		
Boards—per ton—			
News	42.50	@	45.00
Straw	37.50	@	40.00
Chip	40.00	@	42.50
Binders Boards	62.00	@	70.00
Kraft Liner	52.50	@	55.00
Standard 85 Test Jute Liner	35.00	@	37.50
Sgl. Mlg. Ll. Chip	50.00	@	52.50

(F. o. b. Mill)

Wood Pulp Board	70.00	@	80.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	24.00	@	26.00
Dry	24.00	@	26.00

(F.o.b. Mill)

No. 1 Domestic and Canadian	18.00	@	26.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.50	@	2.75
Easy Bleaching	1.85	@	2.00
No. 1 strong unbleached	1.85	@	2.00
Mitscherlich Unbleached	1.85	@	2.00
No. 2 Strong unbleached	1.70	@	1.80
No. 1 Kraft	1.75	@	1.85
No. 2 Kraft	1.60	@	1.70
Sulphate—			
Bleached	2.25	@	3.00

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—			
Bleached	2.50	@	3.00
Easy Bleaching	1.80	@	1.90
News	1.70	@	1.80
Mitscherlich unbleached	2.25	@	2.50
Kraft (Domestic)	1.50	@	2.75
Soda Bleached	2.50	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	5.75	@	6.25
Silesias No. 1	4.00	@	4.50
New Unbleached	6.75	@	7.25
New Soft Blacks	3.00	@	3.25
Blue Overall	4.25	@	4.50
Fancy	2.00	@	2.25
Washables	1.75	@	2.00
Mixed Khaki Cuttings	2.50	@	2.75
O. D. Khaki Cuttings	3.13	@	3.38
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.75	@	4.00
Miscellaneous	3.00	@	3.50
White, No. 2—			
Repacked	2.00	@	2.50
Miscellaneous	1.75	@	2.00
Thirds and Blues—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	.90	@	.95
No. 2	.80	@	.85
No. 3	.75	@	.80
No. 4	.70	@	.75
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	1.50	@	1.60
New Mixed Cuttings	1.60	@	1.70
New Light Silesias	3.50	@	3.75
Light Flannelettes	3.25	@	3.50
Unbleached Cuttings	5.50	@	5.75
New White Cuttings	5.00	@	5.50
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	6.25	@	6.75
No. 2 White Linens	5.25	@	5.75
No. 3 White Linens	4.25	@	4.00
No. 4 White Linens	2.00	@	2.25
No. 1 White Cotton	3.75	@	4.00
No. 2 White Cotton	3.00	@	3.25
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.50	@	1.60
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.65	@	1.80
French Blue Linens	2.10	@	2.25
German Blue Linens	1.85	@	2.00
German Blue Cottons	1.35	@	1.50
Checks and Blues	1.30	@	1.40
Lindsay Garments	1.10	@	1.15
Dark Cottons	.95	@	1.00
Old Shopperies	.85	@	.90
New Shopperies	.80	@	.85
French Blues	1.50	@	1.65

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.30	@	1.40
Domestic	1.25	@	1.35
Wool Tares, light	1.05	@	1.15
Wool Tares, heavy	1.05	@	1.15
Bright Bagging	1.00	@	1.10
Manila Rope—			
Foreign	2.75	@	3.00
Domestic	2.50	@	2.75
Small Mixed Rope	1.00	@	1.25
New Burlap Cut	1.50	@	1.75
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.65	@	2.85
Ordinary Hard White No. 1	2.40	@	2.50
Hard White No. 2	2.30	@	2.40
Soft White No. 1	2.20	@	2.30
Flat Stock—			
Stitchless	1.05	@	1.15
Overissue Mag	1.05	@	1.15
Solid Flat Book	.95	@	1.05
Crumpled No. 1	.85	@	.90
Solid Book Ledger	1.50	@	1.75
Ledger Stock	1.05	@	1.15
New B. B. Chips	.65	@	.70
Manilas—			
New Env. Cut	1.60	@	1.70
New Cuttings	1.20	@	1.25
Extra No. 1 old	.90	@	1.00
Print	Nominal		
Bogus Wrapper	.70	@	.80
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.20	@	1.30
News—			
No. 1 White News	1.20	@	1.30
Strictly Overissue	.75	@	.85
Strictly Folded	.80	@	.85
No. 1 Mixed Paper	.80	@	.85

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Twines
(F. o. b. Mill)

Cotton—			
B. C. 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.15	@	.16
Tube Rope—			
4-ply and larger	.09¾	@	.11¾
Fine Tube Rope—			
4-ply	.13¾	@	.14¾
3-ply	.14¾	@	.14¾
2-ply	.15¾	@	.15¾
Paper Makers Twine	.08¾	@	.10¼
Box Twine, 2-3 ply	.12¾	@	.13½
White Hemp	.12¾	@	.15¾
Java Sisal—			
No. 1 Basis	.11½	@	—
No. 2 Basis	.10½	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.13½	@	.15½
No. 2	.11½	@	.13½
Manila Twine	.24½	@	.29½

CHICAGO

Paper
(F. o. b. Mill)

Bag Bond	.30	@	.53¾
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¼	@	.06¾
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¼	@	.04¾
Sulphite Screenings	.03	@	.03½
Manila Tissue	.07	@	.07¾
White Tissue	.07¼	@	.07½

(Delivered Central Territory)

News, per ton—			
Rolls, contract	45.00	@	—
Sheets	50.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	—
Solid News	43.50	@	—
Manila Lined Chip	47.50	@	—
Patent coated	55.00	@	—
Container Lined—			
85 Test	60.00	@	65.00
100 Test	60.00	@	70.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	1.80
No. 1 Hard White	1.40	@	1.50
No. 1 Soft White	1.20	@	1.30
Ledger & Writings	.80	@	.90
Solid Books	.80	@	.90
Blanks	1.00	@	1.05
Kraffs	.90	@	1.00
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	1.00	@	1.05
Print Manila	.60	@	.65
Overissue News	.60	@	.70
Old Newspapers—			
No. 1	.55	@	.65
Mixed Papers—			
No. 1	.50	@	.55
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¼	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.10
Manila Sul., No. 1	.03	@	.06
Manila No. 2	.03	@	.05
No. 1 Kraft	.05¼	@	.06½
No. 2 Kraft	.03¾	@	.05
Southern Kraft	2.75	@	4.00
Common Bogus	.03	@	.04½

(Delivered Philadelphia)

News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	37.00	@	45.00
Chip Board	40.00	@	45.00
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03½	@	.04
New White, No. 2	.02½	@	.03
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.15	@	2.25
No. 2 Hard White	1.85	@	2.00
No. 1 Soft White	1.80	@	2.00
No. 2 Soft White	1.15	@	1.25
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.70	@	.80
Solid Ledger Stock	1.35	@	1.50
Writing Paper	1.10	@	1.20
No. 1 Books, heavy	1.15	@	1.25
No. 2 Books, light	.90	@	1.00
No. 1 New Manila	1.65	@	1.75
No. 1 Old Manila	.90	@	1.00
Print Manila	.90	@	.95
Container Manila	.85	@	.90
Old Kraft	1.20	@	1.25
Common Paper	.65	@	.70
No. 1 Mixed Paper	.75	@	.80
Straw Board Chip	.70	@	.75
Binders Board Chip	.70	@	.75
Corrugated Board	.90	@	.95
Overissue News	.75	@	.80
Old Newspaper	.75	@	.80

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.06	@	.11½
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	—	@	.04¾
No. 2 Kraft	.03½	@	—

(F. o. b. Boston)

Southern Kraft	.03½	@	—

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¼

(Delivered New England points)

News Print, rolls	44.50	@	—
Straw Board, rolls	.009	—	@35.00
Straw Board in Sheets, basis 35s to 70s	—	@40.00	
Filled News Board	42.50	@47.50	
Chip Board	40.00	@45.00	
Chip Board (Creasing)	—	@42.50	
Single Manila Lined Chip	50.00	@60.00	
Single White, Patent Coated News Board—Bender	60.00	@70.00	
Wood Pulp Board	70.00	@75.00	
Binder Boards	62.00	@75.00	

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Soft White	1.90	@	2.00
No. 1 Old Manila	.50	@	.60
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	1.00
No. 1 Books, heavy	1.00	@	1.10
No. 1 Books, light	.80	@	1.00
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.90	@	1.00
White Blank News	1.20	@	1.30
No. 1 Kraft	1.10	@	1.20
Manila	.90	@	1.05
No. 1 Mixed Papers	.62½	@	.65
Print Manila	.80	@	.85
Overissue News	.80	@	.90
Old Newspapers	.70	@	.75
Box Board Chips	.55	@	.65
Corrugated Boxes	.62½	@	.85
Screening wrappers	.75	@	.85

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	2.75	@	—
Domestic	2.50	@	—
Transmission Rope	1.50	@	—
Mixed Strings	.85	@	—
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.35	@	1.45
Domestic	1.25	@	—
Bleachery Burlap	3.00	@	3.25
Scrap Burlap	1.00	@	1.10
No. 1 Scrap Burlap	1.10	@	1.20
Scrap Sisal	.85	@	1.10
Scrap Sisal for shredding	1.10	@	—
Wool Tares, heavy	1.10	@	1.25
New Burlap Cutting	.95	@	1.00
Australian Wool Pouches	2.50	@	—
Heavy Baling Bagging	1.25	@	1.50
Paper Mill Bagging	.85	@	.95
Bagging No. 2	.50	@	.60
No. 1 Burlap	1.75	@	2.25

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.02	@	.02¼
New White No. 1	.05½	@	.06
New White No. 2	.04½	@	.05
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.06	@	—
Fancy	—	@	.02½
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.03	@	.03¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	.04	@	.04¼

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	—
White No. 2—			
Repacked	.01½	@	.01¾
Miscellaneous	.01½	@	.01¾
Twos and Blues	1.25	@	1.50
Thirds and Blues			
Repacked	1.10	@	1.25
Miscellaneous	.85	@	.90
Black Stockings	2.25	@	2.50
Roofing Stock			
No. 1	.90	@	.95
No. 2	.80	@	.85
No. 3	.45	@	.50

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.00	@	1.10
New White Shirt Cuttings	.05	@	.06
Dutch Blues	2.00	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.25	@	1.55
Old Linsey Garments	1.05	@	1.25

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.09¾	@	—
No. 2 Sulphite	.08	@	—
No. 1 Colored	.10¾	@	—
No. 2 Colored	.08½	@	.10¼
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	@	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.00	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	45.00	@	50.00
Sulphate	50.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	1.80	@	2.00
Soft White	1.40	@	1.80
White Blk. News	1.25	@	1.50
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.50
Printed Manilas	.55	@	.80
Kraft	1.25	@	1.50
News and Scrap—			
Strictly Overissue	.70	@	—
Strictly Folded	.60	@	—
No. 1 Mixed Paper	.55	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.04¼	@	.04½
Fancy Shirt Cuttings	.02¾	@	.02½